ORGANIZATION AND MANAGEMENT FOR THE MANUFACTURE OF MOTOR TRUCK BODIES

A THESIS

Submitted in partial fulfillment
of the requirements for the Degree
of Master of Science in Industrial Management

by

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Georgia School of Technology
Atlanta, Georgia
1946

ORGANIZATION AND MANAGEMENT

FOR THE MANUFACTURE OF

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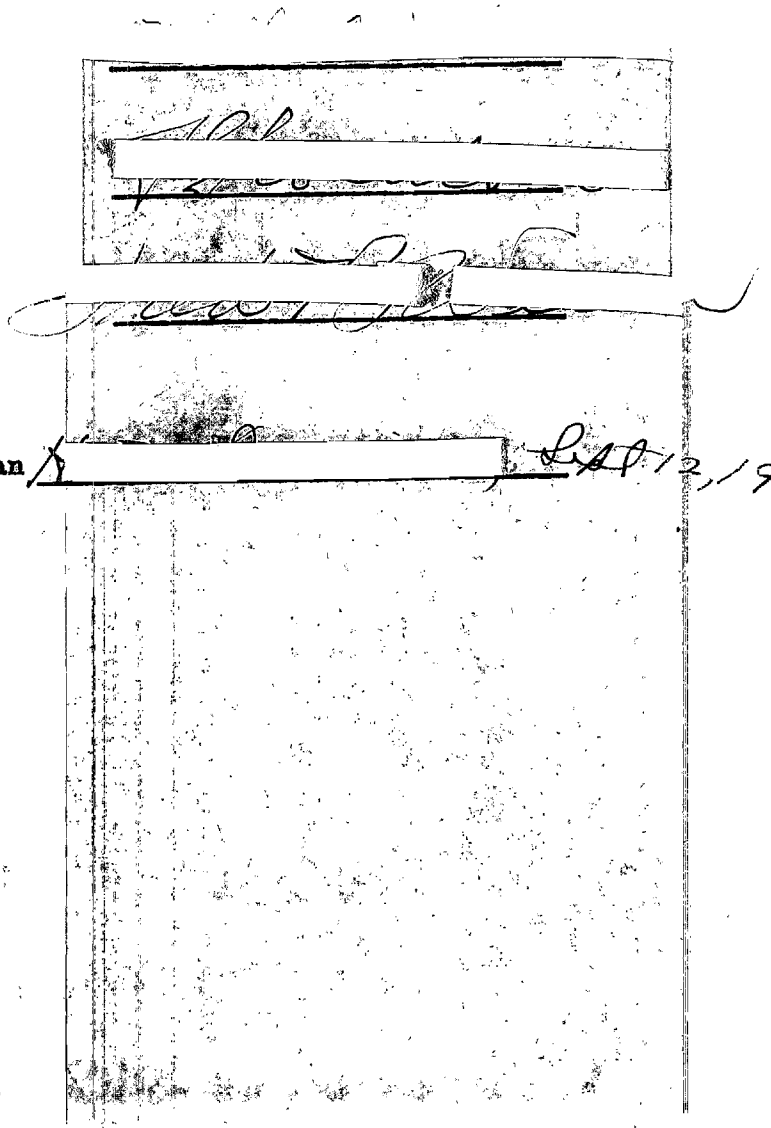

Date Approved by Chairman: April 12, 1944

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ORGANIZATION AND MANAGEMENT FOR THE MANUFACTURE OF MOTOR TRUCK BODIES

I INTRODUCTION

The manufacture of bodies for motor trucks is a specialized and supplementary phase of the Motor Truck Industry. Though most large truck manufacturers build a standard line of panel and stake bodies, the great majority of bodies are manufactured by small independent producers distributed throughout the United States. These Body Manufacturing Plants range in size from small job shops to plants having over $1,000,000 capital and producing a wide line of standard body types.

In the pages which follow, the results of an investigation of the Body Manufacturing facilities of the Southeastern United States (including Georgia, Alabama, Florida, North Carolina, South Carolina, Tennessee, and Kentucky) will form the basis of a thesis designed to present in comprehensive form the necessary steps in Organizing and Managing a Truck Body Manufacturing Plant of small or medium size.

II MARKETING

A. Existing Body Manufacturing Plants in the Southeast.

A necessary prerequisite to the formation of any manufacturing organization is an analysis of the market. This analysis should include not only a study of the market demands and market areas, but should cover the existing facilities of supply.

The Map, Figure 1., indicates the location of cities, in the area under consideration, which have one or more Body Manufacturing Plants. Table I. lists these plants and indicates the types of bodies built by each plant, as well as the Dunn & Bradstreet rating of each plant. As will be noted, these plants build a rather diversified line of bodies for distribution to a wide range of customers scattered throughout the country. Many types of bodies are in common use; among these are van bodies, refrigerator bodies, milk bodies, panel bodies, bakers bodies, delivery bodies, moving van bodies, stake bodies, bottlers bodies, and ice cream bodies of varying design and capacity.

Though the majority of sales are made to customers in the immediate vicinity of the plant as well as the bordering states, some deliveries are made to distant points. The output capacity of the different plants varies over a wide range. This is largely due to a difference in the amount of capital investment. However, some highly capitalized plants build only a few truck bodies as they specialize in the manufacture of trailers.

The Broquinda Corporation[1] of St. Petersburg Florida manufactures most types of closed truck bodies except those which require very

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[1] H. G. Carrison, President, Broquinda Corporation of St. Petersburg, Florida. Letter dated August 13, 1946, p. 1.

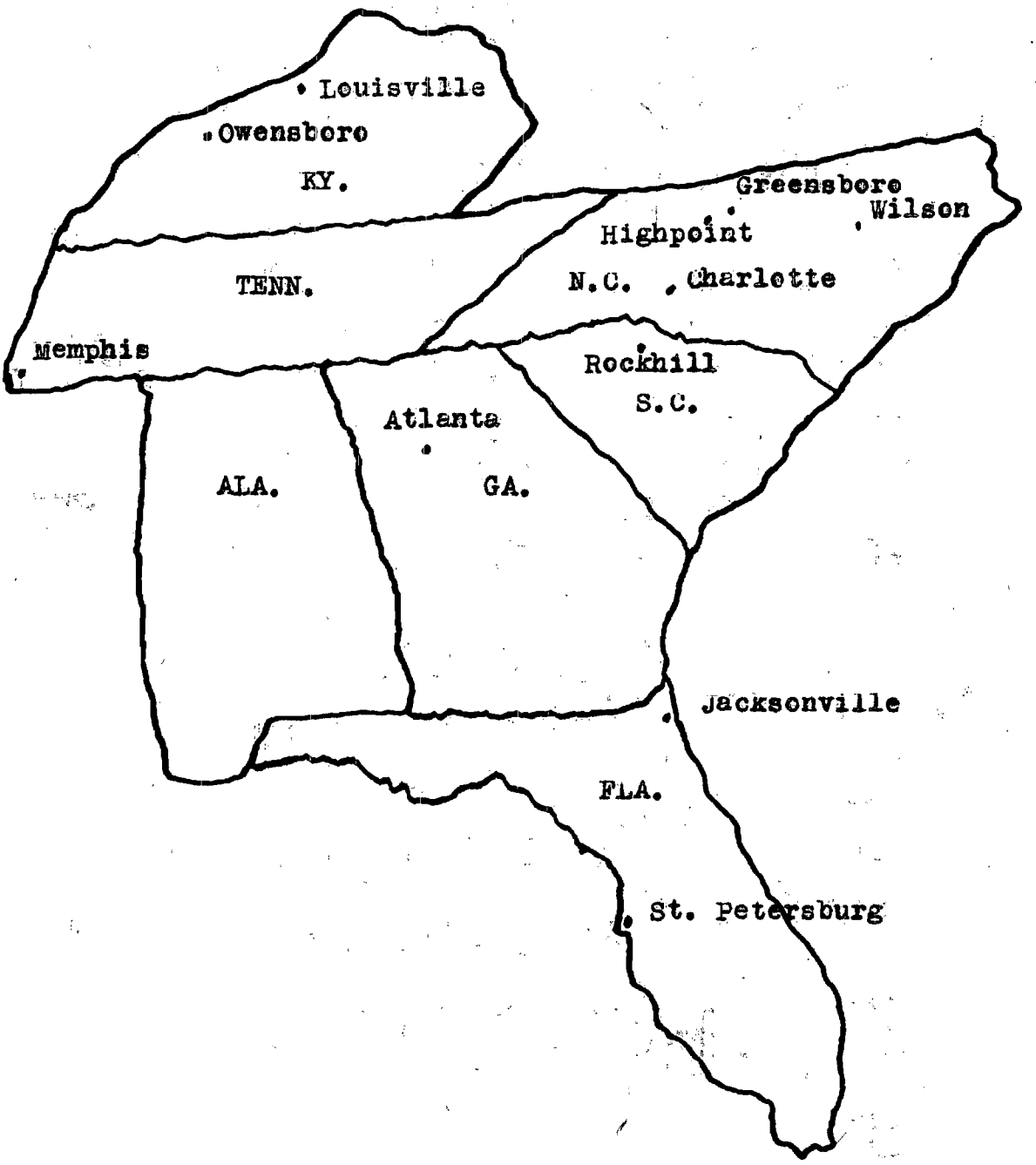

FIGURE 1.

DISTRIBUTION OF BODY MANUFACTURING PLANTS IN THE SOUTHEAST (Thomas Register) 1943

TABLE I.

BODY BUILDING FACILITIES OF THE SOUTHEASTERN UNITED STATES

(Thomas Register of Manufacturers, 1943)

Location	Name of Plant	Rating	Body Types
Jacksonville, Fla.	Rivers Body Factory	D	Stakes, vans, express, ice cream, meat packers, milk delivery, bottlers
St. Petersburg, Fla.	Broquinda, Corp.	X	Dry ice units, refrigerator, closed van
Atlanta, Georgia	A. C. Miller & Co.	B	Van, stakes, dairy, bakery, refrigerator, etc.(special built).
Atlanta, Georgia	Yancey Brothers	C	Special Built
Memphis, Tennessee	Carter Mfg. Co.	A	Closed van, trailers
Rock Hill, S. C.	Rockhill Body Co.	C	Bodies for trucks, trailers, busses.
Wilson, N. C.	Hackney Bros. Body Co.	A	Steel school bus, refrigerator, milk, and van
Charlotte, N. C.	Charlotte Wagon & Auto Company	B	------
Greensboro, N. C.	Ford Body Co.	B	Bus, van, trailers
Highpoint, N. C.	P. A. Thomas Car Works	A	Steel school busses, etc.
Owensboro, Kentucky	Owensboro Mfg. Co.	A	Open and closed van, refrigerator
Owensboro, Kentucky	Owensboro Wagon Co.	A	Van type, bottlers
Louisville, Kentucky	Kentucky Mfg. Corp.	X	-------
Louisville, Kentucky	Kingham Trailer Co.	A	Stake, open and closed van, etc.

specialized tooling, such as metro bodies. They also manufacture refrigerated bodies for low temperature work in various sizes ranging from a body of proper size for a three-quarter ton truck up to and including fifteen and sixteen foot vans. Though the Broquinda Corporation specializes in refrigerator bodies, they also manufacture truck vans for general deliveries, such as bodies for delivery of foodstuffs, paper, cigars, candy, and general merchandise. Bodies are also made for the dairy industry.

"In the early 1920's at the time the consolidated school program was started, Hackney Brothers Body Company, Wilson, North Carolina started building bodies suitable for mounting on trucks to haul school children. This program was followed through 1924 at which time we entered into a new venture of truck bodies for the handling of controlled temperature items, such as ice cream and other commodities requiring refrigeration. Later, a line of milk bodies was added and all this has built into a concern now manufacturing in the neighborhood of 1500 to 2500 bodies per year.

At the present time we are manufacturing school bus bodies for the entire Southeast, a part of the United States reaching from New York State through Mississippi and inquiries from as far west as Montana. The Policy of the Company on the school bus body program has been to be more a regional manufacturer than to try to satisfy markets too far away from our Plant, which policy is dictated by the geographic position of our Plant in relation to the source of supply of chassis on which the bodies are to be mounted.

In the controlled temperature field, we find that we are in a much different position since we go into the control temperature manufacture at considerable detail and are fast growing out of the regional manufacturing status.

We are at the present time delivering refrigerator bodies as far West as Modesto, California, with deliveries in Montana, Texas, Oklahoma, Missouri, and all the states East of the Mississippi River. The refrigerator body volume has grown from approximately 30 to 40 in the late 1920's to the neighborhood of 300 to 350 bodies per year with a demand far in excess of our ability to produce.

We are also entering into the milk delivery body field more extensively and are making an attempt to be more than a regional manufacturer of this type of truck body in the States East of the Mississippi with a possibility of opening up the Texas field.

We will sell an average of 500 to 700 School Bus Bodies per year, 200 to 400 refrigerator bodies, and 400 to 600 milk bodies."[2]

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[2]W. T. Boos, Sales Department, Hackney Bros. Body Co., Wilson, North Carolina; letter dated August 9, 1946, p. 1.

A. C. Miller & Co.[3] of Atlanta, Georgia, with a maximum capacity of 600 to 800 bodies per year, manufactures custom built bodies under the trade name TUBILT. The five general types that are custom built by A. C. Miller & Co. are (1) Bakers, (2) Dairy, (3) Van, (4) Confectioners, and (5) Tobacco. These bodies are widely used by various industries throughout North and South Carolina, Tennessee, Alabama, Georgia, and Florida. However, the majority of customers are in the immediate vicinity of Atlanta.

Though most Body Manufacturers in the Southeastern States build a diversified line of body types, some Body Manufacturers have standardized their products to a single type. This is true of the Carter Manufacturing Company of Memphis, Tennessee. This Company specializes in the manufacture of trailers and also produces a standard truck body of the closed van type.

"Normally, that is prior to World War II, the Carter Manufacturing Company of Memphis, Tennessee manufactured a complete line of commercial truck bodies built to customers specifications. In other words our production at that time was, generally speaking, custom building.

At the present time, however, since our prices are frozen at 1941 levels and since material and labor costs generally have increased, we are forced to standardize our production and build bodies within very narrow specification limits in order to continue in business.

Prior to the war our production was approximately 1000 truck bodies a year including all types. This ranged from very light stake bodies to the heavier commercial truck bodies. The maximum capacity of the truck body division at present is approximately 1000 per year, but on the basis of our present production figures we should build approximately 600 truck bodies of the van, closed, type, this year. This is the type which we have standardized on."[4]

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[3]Pat Miller, A. C. Miller & Co., Atlanta, Georgia; letter dated August 20, 1946, p. 1.

[4]N. A. Carter, Jr., Carter Manufacturing Company, Memphis, Tennessee; letter dated August 8, 1946, pp. 1-2.

B. Location of Markets.

The area under consideration (Georgia, Florida, Alabama, North Carolina, South Carolina, Tennessee, and Kentucky) has been a good market for motor truck sales in past years; in 1941 there were 485,750 motor trucks registered in this area, which represents 11.5% of the total registration in the United States.[5] These figures show clearly the potentialities of the market. Since the sale of truck bodies of all types is predicated upon the existence and the sale of trucks, the number of registered trucks in a given region will indicate the location of the most fertile truck body markets. In the States under consideration, the registration of trucks in 1941 was as follows:[6]

Alabama	69500
Florida	88800
Georgia	95800
South Carolina	53250
North Carolina	97250
Tennessee	81150
Kentucky	81250
Total	567000

Within the overall sales area, the most fertile markets will be the principal cities of the various States. The map, Figure 2, indicates the location of these principal cities and the tabulation which follows indicates the number of registered trucks in each. Statistics prove that 23% of all

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[5] U. S. Public Roads Administration, December 31, 1941.

[6] Ibid.

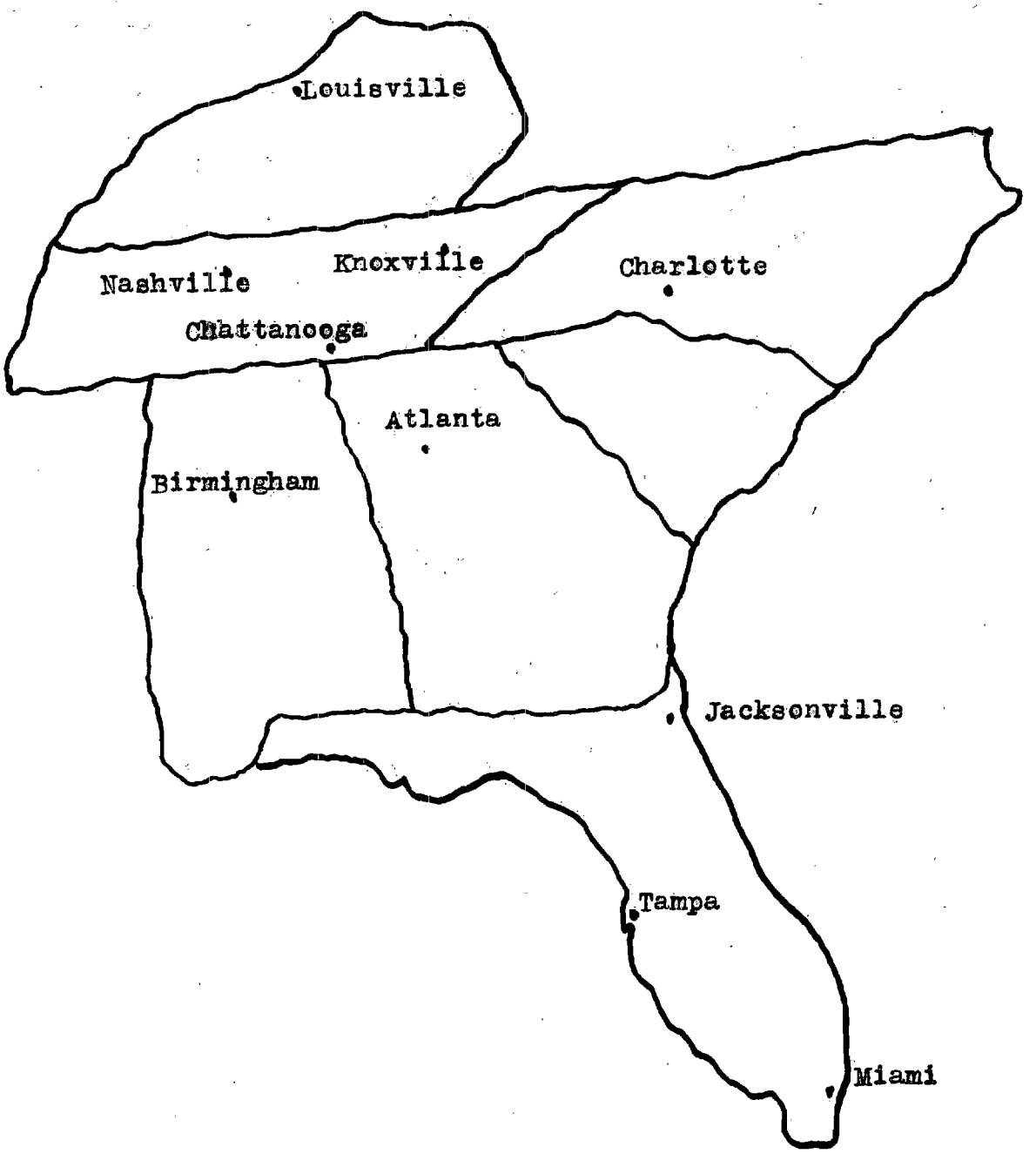

FIGURE 2.

DISTRIBUTION OF PRINCIPAL CITY MARKETS IN THE SOUTHEAST.
(Thomas Register, 1943)

registered trucks are in cities that have above 100,000 population:[7]

City	Registered Trucks (1941)
Miami, Florida	9037
Tampa, Florida	5895
Jacksonville, Florida	7577
Birmingham, Alabama	8224
Chattanooga, Tenn.	3886
Knoxville, Tenn.	4118
Nashville, Tenn.	5877
Charlotte, North Carolina	5167
Louisville, Kentucky	10002
Atlanta, Georgia	12873

6. Channels of Sale.

As a general rule, direct sale to the consumer or oustomer is the best channel for marketing motor truck bodies. However, some oompanies such as the Carter Manufacturing Company of Memphis, Tennessee handle their products through authorized distributors who in turn re-sell the equipment at retail and wholesale to dealers.[8] The high freight rates on finished products such as truok bodies makes it almost imperative that bodies be installed on the truck chassis at the Body Plant and then the trucks can be driven to their destination. This particular aspect of body manufacture has a tendency to limit sales of bodies to a regional basis.

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[7]Reuben H. Donnelley Corporation, July 1, 1941

[8]N. A. Carter, Jr., op. oit., pp. 1-2.

D. Terms of Sale.

In general, the sale of truck bodies is on a strictly cash basis. However, some companies such as A. C. Miller & Co., of Atlanta, Georgia sell "net 30 days to approved credit risks".[9] In this type of manufacturing, especially in the case of small concerns, it is strongly recommended that all transactions be conducted on a strictly cash basis. Numerous loan agencies can adequately finance customers, such as farmers, who may be compelled to purchase on the installment plan.

E. Kinds of Customers.

The kinds of customers encountered in the Body Manufacturing business vary widely depending on the types of bodies which are sold. In general, the types of customers will be determined by the various uses to which these numerous bodies may be put.

> "The customers vary on the school bus business, contract haulers as well as State Governments being represented. Refrigerator bodies are sold mostly to the ice cream manufacturers and frosted food distributors with some small volume of sales going to meat packers and distributors. On the refrigerator body business, we anticipate the development of the refrigerator type body being accepted by the fish dealers throughout this section of the country, in which case we expect some business from this source."[10]

Van bodies are used largely by department stores, furniture stores, moving companies, grocery stores, and feed dealers. Refrigerator bodies are used primarily to haul perishables such as fresh meats, fish, and vegetables. Bakery bodies, as the name implies, are used in hauling bakery products and sales will be made to bakeries. Stake bodies are normally used in construction work, farming, and general transfer service.

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[9]Pat Miller, A. C. Miller & Co., Atlanta, Georgia; letter dated August 20, 1946, p. 1.

[10]W. T. Boos, op. cit. pp. 1-2.

F. Advertising.

(1) Mediums

The marketing of truck bodies, like most other marketing problems, involves a certain amount of advertising. For greatest efficiency this advertising should be concentrated in the chosen sales area and should be so directed as to reach the types of people who will be potential buyers of truck bodies. When the sales area comprises only a few States it is obvious that costly advertising in a national publication would be pointless.

The dictates of reason and experience have proven that the use of trade journals, bulletins, and papers is the most desirable method of advertising truck bodies. In the Southeastern United States this general procedure is in vogue. A. C. Miller & Co., Atlanta, Georgia makes use of trade journals such as the "New South Baker" for advertising Bakery bodies, and the "Southern Dairy" for advertising Dairy bodies.[11] The Carter Manufacturing Company, Memphis, Tennessee advertises primarily in trade journals and state truck association bulletins and papers.[12] The use of National Trade Publications as advertising mediums is reported by one plant in the Southeast.[13]

(2) Estimated Costs

The costs of advertising varies considerably, depending to a large extent on the selected medium and the frequency at which advertisements are used. A. C. Miller & Co., advertise regularly in the "New South Baker"

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[11] Pat Miller, A. C. Miller & Co., Atlanta, Georgia; letter dated August 20, 1946, p. 1.

[12] N. A. Carter, Jr., op. cit. pp. 1-2.

[13] W. T. Boos, op. cit. pp. 1-2.

and the "Southern Dairy". For a 1/4 page advertisement run 12 times, the approximate cost is $40.00 per issue. Other mediums such as the "Southern Automotive Journal" cost considerably more, the rates varying with the size advertisement and the frequency. Rates for the "Southern Automotive Journal are as follows:[14]

1/8 page	.....	$45 per issue for 1 issue
		$40 per issue for 6 issues
		$35 per issue for 12 issues
1/4 page	.....	$65 per issue for 1 issue
		$60 per issue for 6 issues
		$55 per issue for 12 issues
1/2 page	.....	$125 per issue for 1 issue
		$112 per issue for 6 issues
		$100 per issue for 12 issues

The value of newspapers as an advertising medium for Truck Bodies is questionable. The coverage is broad and the appeal is not directed at potential buyers. In addition the advertising rates are high, costing approximately $3.00 per column-inch.[15] At this rate a 3 column, 6 inch advertisement would cost approximately $54.00 for one issue. In stimulating the sales of a new enterprise, as well as in maintaining sales, advertising is a very important medium. However, care should be used in organizing an advertising campaign to avoid useless expenditure; the amount invested in advertising will depend to a large extent on the capital

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[14]W. R. C. Smith Publishing Company, Atlanta, Georgia

[15]Atlanta Journal, Atlanta, Georgia

available and upon the results obtained. Some companies obtain excellent results at relatively low cost. For instance, "the cost of advertising for the Carter Manufacturing Company is very low amounting to 1% of sales."[16]

G. Suggested Body Types for a New Body Plant.

A newly organized body plant should make a diversified line of body types to appeal to a broad range of customers. The types in great demand in the southeastern area are (1) Van bodies, (2) Refrigerator bodies, (3) Bakers bodies, and (4) Stake bodies. (See figure 3 and figure 4). These four types can form a solid nucleus around which a more diversified business can be built. The flexibility of the machinery and raw materials used in body manufacture is such that conversion from one type to another is readily accomplished. If the condition of the market indicates, it may be necessary for a plant to specialize rather than diversify, however in normal times the four types listed above will receive great demand in the southeastern area.

On the basis of available figures on the production capacity of the various plants in the southeastern area, a medium sized plant may be considered as one having an output of approximately 90 bodies per month or 1080 bodies per year. In the pages which follow, the discussion will be based on an assumed output of 90 bodies per month distributed among the four body types previously suggested.

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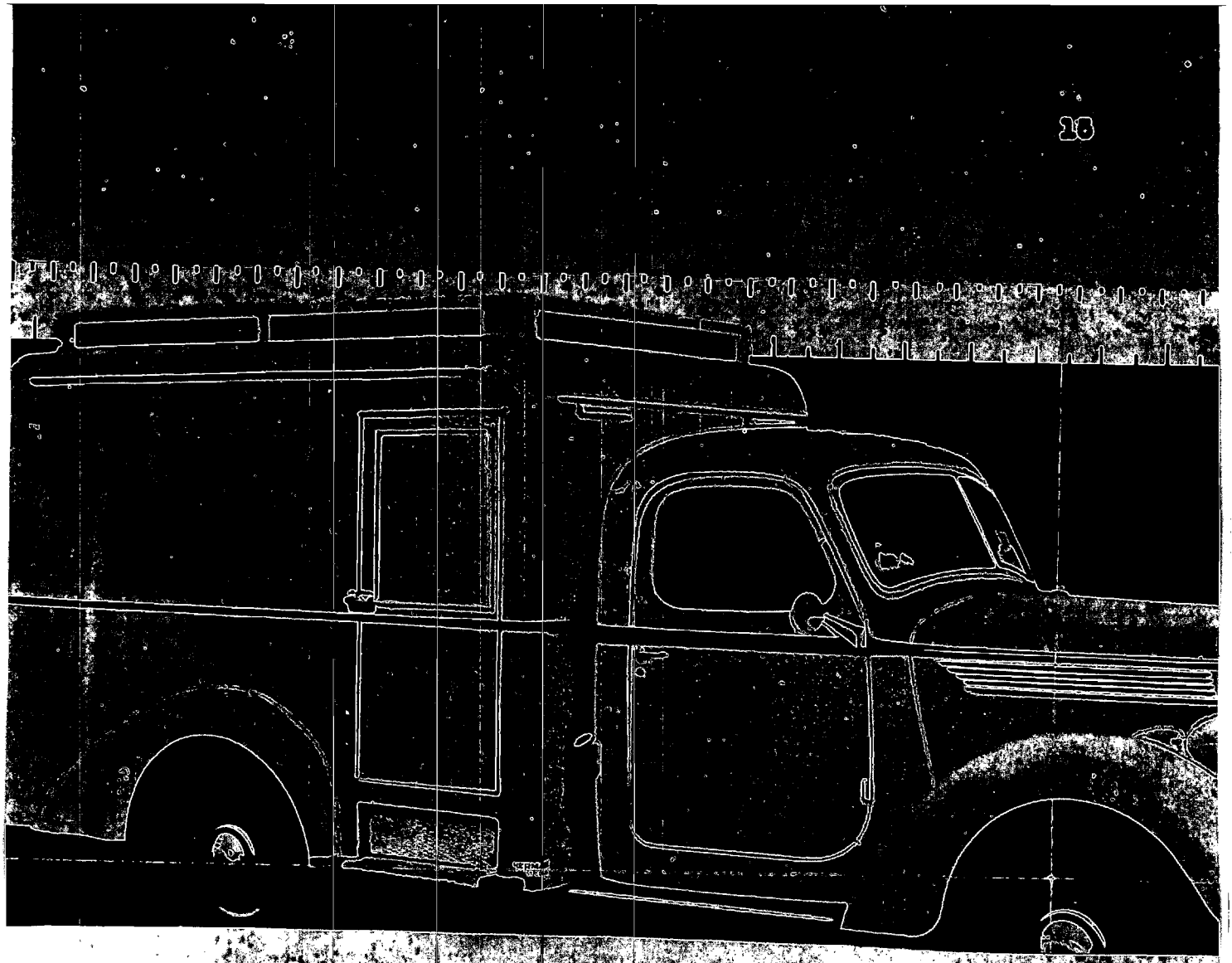
[16] N. A. Carter, Jr., op. cit. pp. 1-2.

Van Body Type

Refrigerator Body Type

FIGURE 3.

VAN & REFRIGERATOR BODIES



Bakery Body Type

Stake Body Type

FIGURE 4.

BAKERY & STAKE BODIES

III PLANT LOCATION

A. Geographical

1. General Considerations in Choosing a Location.

In selecting a plant location for a Body Manufacturing enterprise, three main factors must be considered: (1) the location of the plant with references to markets, (2) the transportation facilities to and from the plant, and (3) the location of the plant with reference to the raw materials. The relative importance of all three factors should be weighed and considered in locating any new plant. However, the nature of the Body Building business is such that item (1), above, is of utmost importance. Almost any town of reasonable size receives adequate rail and truck transportation service; for this reason numerous towns in the Southeastern States would serve as suitable plant sites. The cost of the rail shipment of the raw materials used in manufacturing truck bodies is relatively low as will be seen in a later Chapter, and therefore the plant location with reference to raw materials is not a prime consideration in this case.

The location of markets within the area under consideration was previously discussed in Chapter II, Section B. By reference to this section and to the map, Figure 2, a desirable plant location can be selected. Large cities are dispersed evenly throughout the area and these cities will be the most fertile markets for truck bodies; under such conditions, the most desirable plant location would be a point in the geographical center of the market area. On the basis of this reasoning, Atlanta, Georgia, which occupies the approximate geographical center of the market area in question, is recommended as the best location for a body plant.

2. Location of Suggested Plant Site (Atlanta, Georgia) with reference

to Raw Materials, Transportation and Markets.

a. Raw Materials.

Many raw materials used in the manufacture of truck bodies can be obtained locally. Other raw materials such as sheet metal, cross bolsters, and liner slat sections can be conveniently obtained from manufacturers in Ohio, Pennsylvania, and West Virginia.[17] With the increasing development of Southern industries, these products may eventually be manufactured and made available locally.

b. Transportation.

"Atlanta, Georgia is located on the Dixie and Bankhead highways, has a municipal airport, and is served by 15 lines of eight railways: the Atlanta, Birmingham, and Coast, the Atlanta and West Point, the Central of Georgia, the Georgia, the Louisville and Nashville, the Nashville, Chattanooga and St. Louis, the Seaboard Airline and the Southern."[18]

"Atlanta's trade area embraces the entire southeastern quarter of the United States. In 1939 there were 809 wholesale houses, 3833 retail establishments, and 902 manufacturing establishments in the city, and 152 transport companies operating 2000 motor trucks for commercial hauling exclusively; 500 cars of package freight moved out daily over the various railways."[19]

c. Markets.

Since Atlanta, Georgia is in the approximate center of the market area, it is conveniently located with reference to the markets, the most fertile of which will be the large cities dispersed throughout the area. The names of these cities and their approximate distance from Atlanta may be listed as follows:[20]

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[17]Pat Miller, Interview, July 1946.

[18]Encyclopaedia Britannica, Copyright 1945, Vol. 2, page 629.

[19]Encyclopaedia Britannica, Copyright 1945, Vol. 2, page 630.

[20]Rand McNally Road Atlas, 1946, page 102.

City	Distance from Atlanta
Miami, Florida	674 miles
Tampa, Florida	471 miles
Jacksonville, Florida	325 miles
Birmingham, Alabama	167 miles
Chattanooga, Tennessee	125 miles
Knoxville, Tennessee	190 miles
Nashville, Tennessee	256 miles
Charlotte, North Carolina	260 miles
Louisville, Kentucky	442 miles

It can be readily seen from the map, Figure 2. that, with the exception of southern Florida, the sales territory comprises an area having a radius of about 325 miles with Atlanta, Georgia at the center.

B. Locally.

In Atlanta, Georgia, an ideal location for a Body Plant of the type under consideration would be on the Seaboard Airline Railway in the vicinity of Northside Drive. This area is a growing industrial area and is located about three miles from the downtown railroad station. The area is just outside the city limits in Fulton County, and by locating there, the city taxes can be avoided.

The suggested area is convenient to downtown Atlanta and to Atlanta's better residential sections, and is well served by bus transportation. This feature will be especially desirable to employees who do not own automobiles.

IV PLANT

A. Land.

The minimum size lot required for a body plant with output of 90 bodies per month is indicated in Figure 5. This lot consists of 66,000 square feet of land, 330 feet by 200 feet. This area permits adequate space for the building and for employee parking space. Space is also provided for parking trucks which are in a storage status until bodies are completed. Adequate space for expansion of the storage department is also available.

B. Building.

1. Structure.

The most desirable structure for most manufacturing plants is a building consisting of structural steel, brick, and concrete. Such construction, though costly, presents an attractive appearance and has the added advantage of being durable. The depreciation rate of this type building is much less than for a frame or prefabricated building.

2. Plans and Dimensions.

The plans and dimensions are shown on figures 6, 7, 8, 9, 10, and 11. A ceiling height of 14 or 15 feet should be maintained throughout the plant; this will permit adequate overhead room for all types of work without excessive use of space. The overhead supports must be so constructed to permit the installation of an overhead mono-rail hoist running the length of the building on both sides from the Assembly Department to the Installation Department.

The layout of machinery in the Prefabrication Department permits adequate materials handling and efficient use of available machinery.

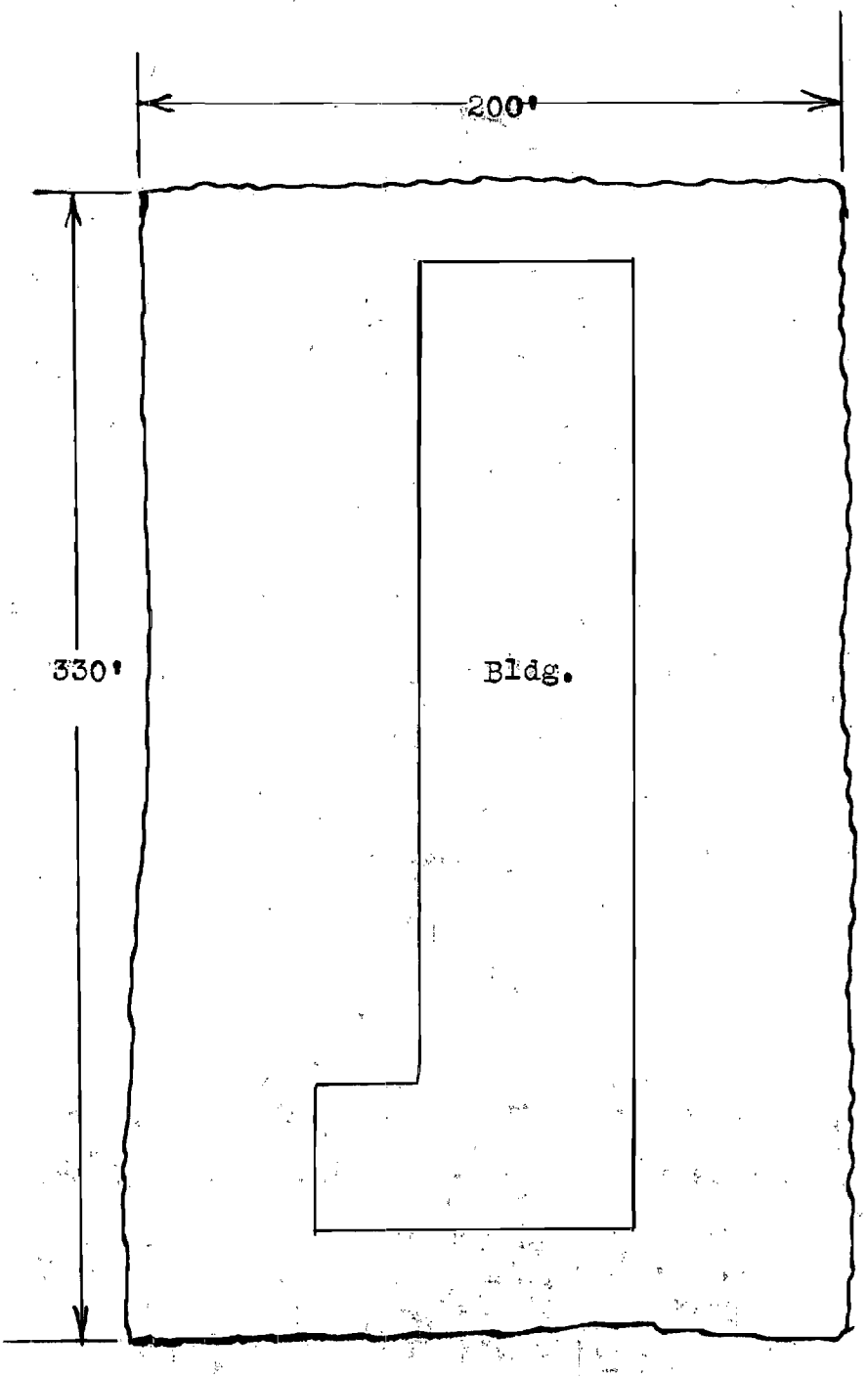

FIGURE 5.

LAND REQUIREMENTS
Scale: 1/16" to 10'

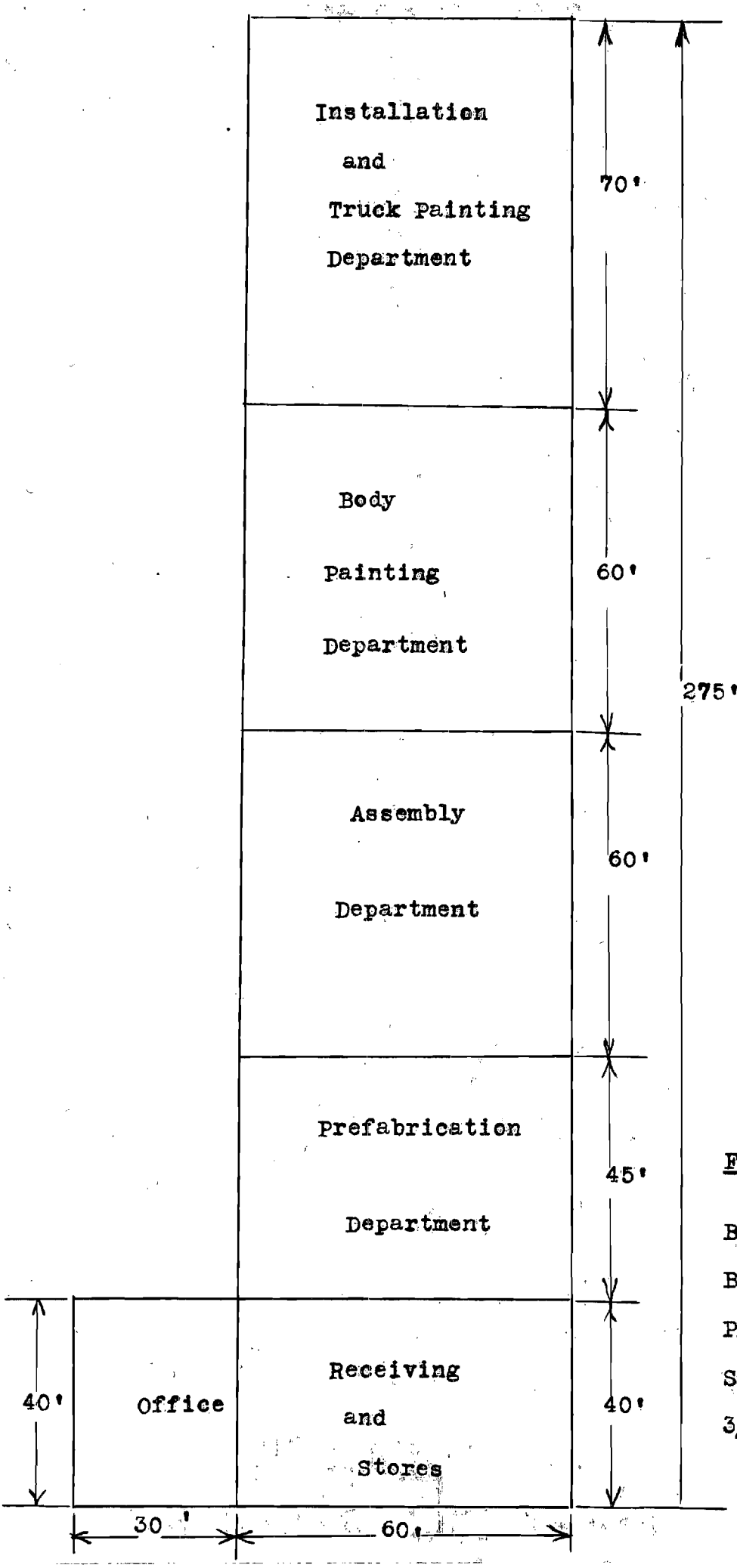

FIGURE 6.

BODY BUILDING PLANT.

Scale: 3/8" to 10'

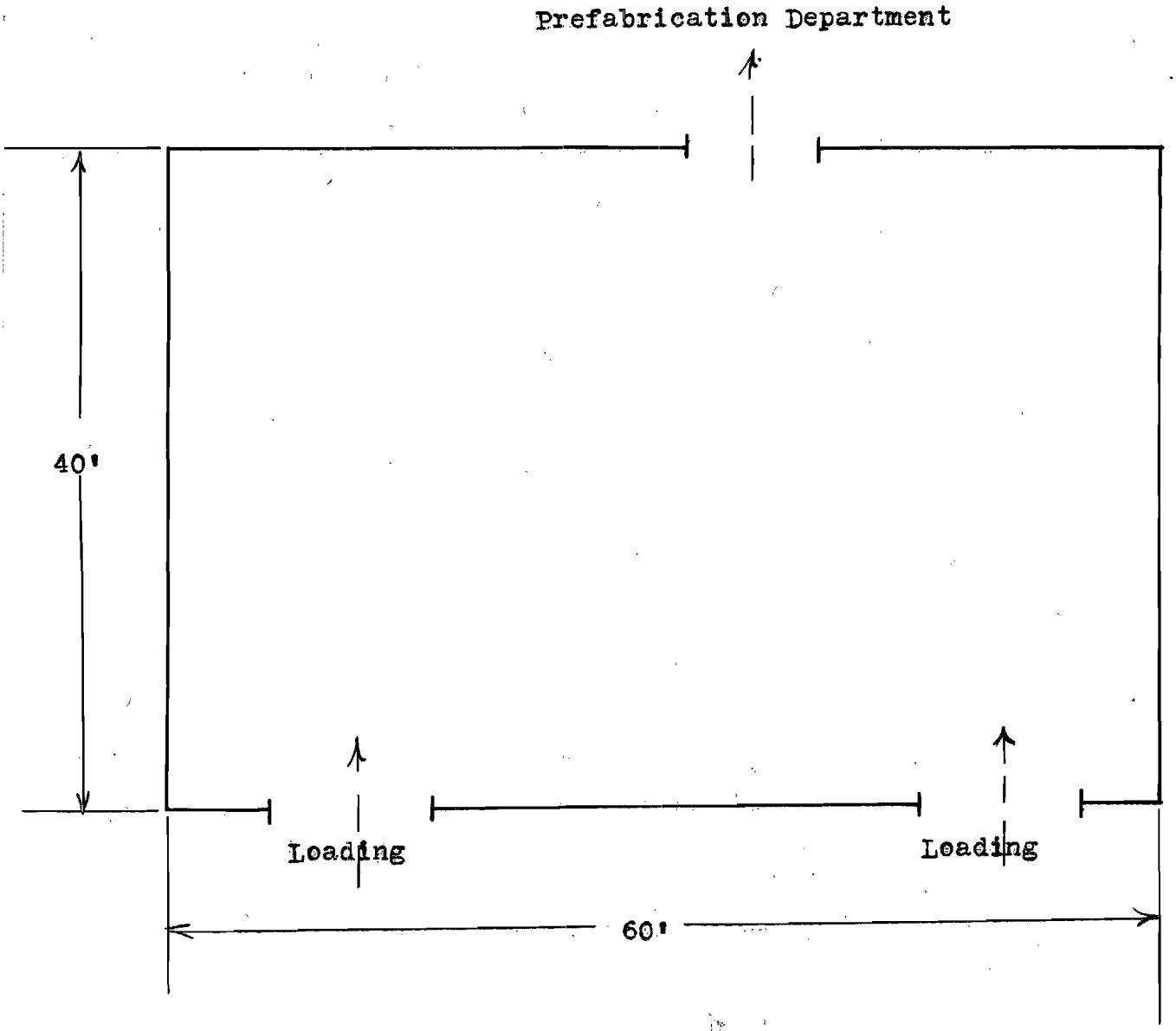

FIGURE 7.

RAW MATERIAL STORAGE

Scale: 1" to 10'

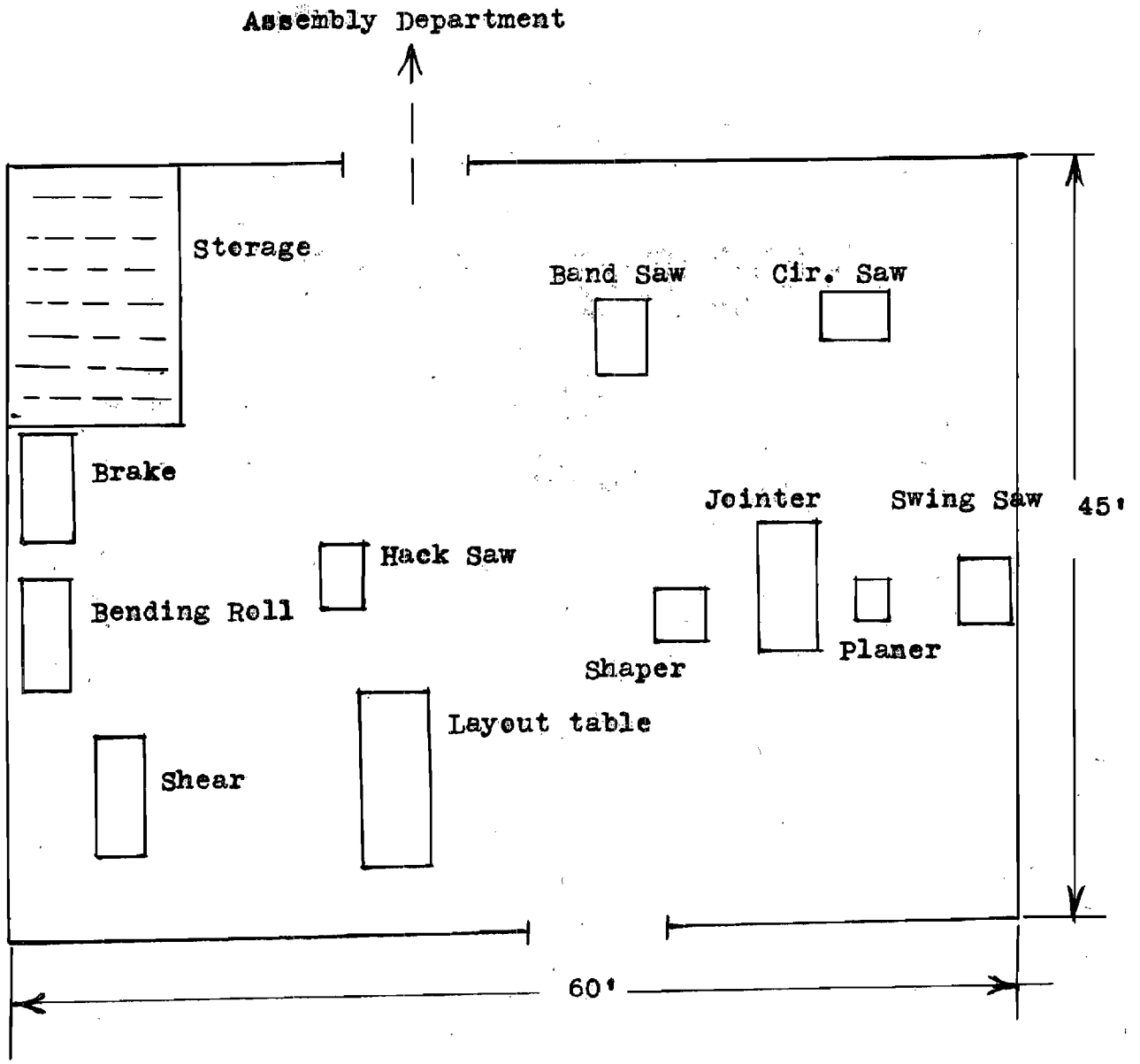

FIGURE 8.

PREFABRICATION DEPARTMENT

Scale: 1" to 10'

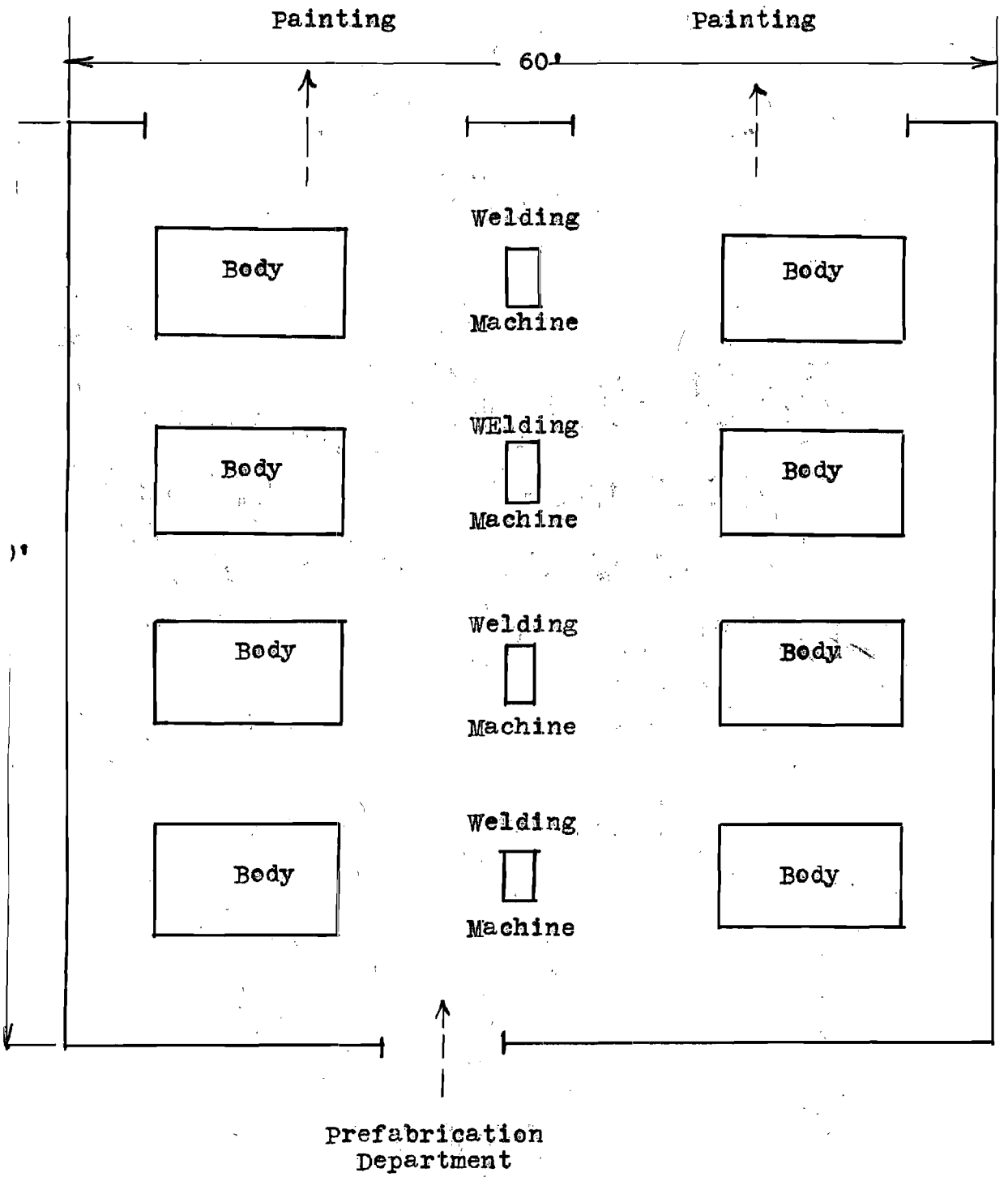

FIGURE 9.

ASSEMBLY DEPARTMENT

Scale: 1" to 10'

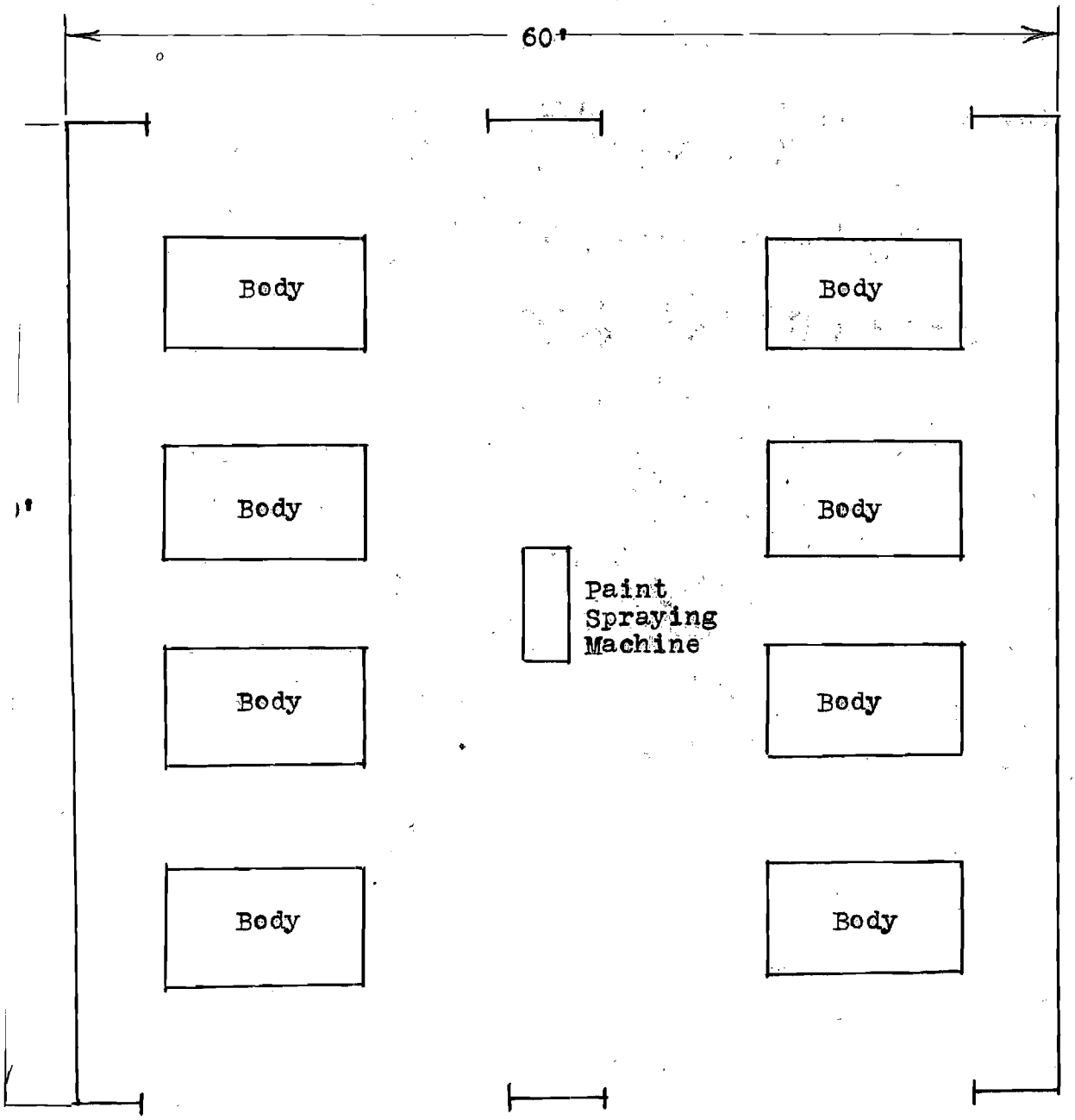

FIGURE 10.

PAINTING DEPARTMENT

Scale: 1" to 10'

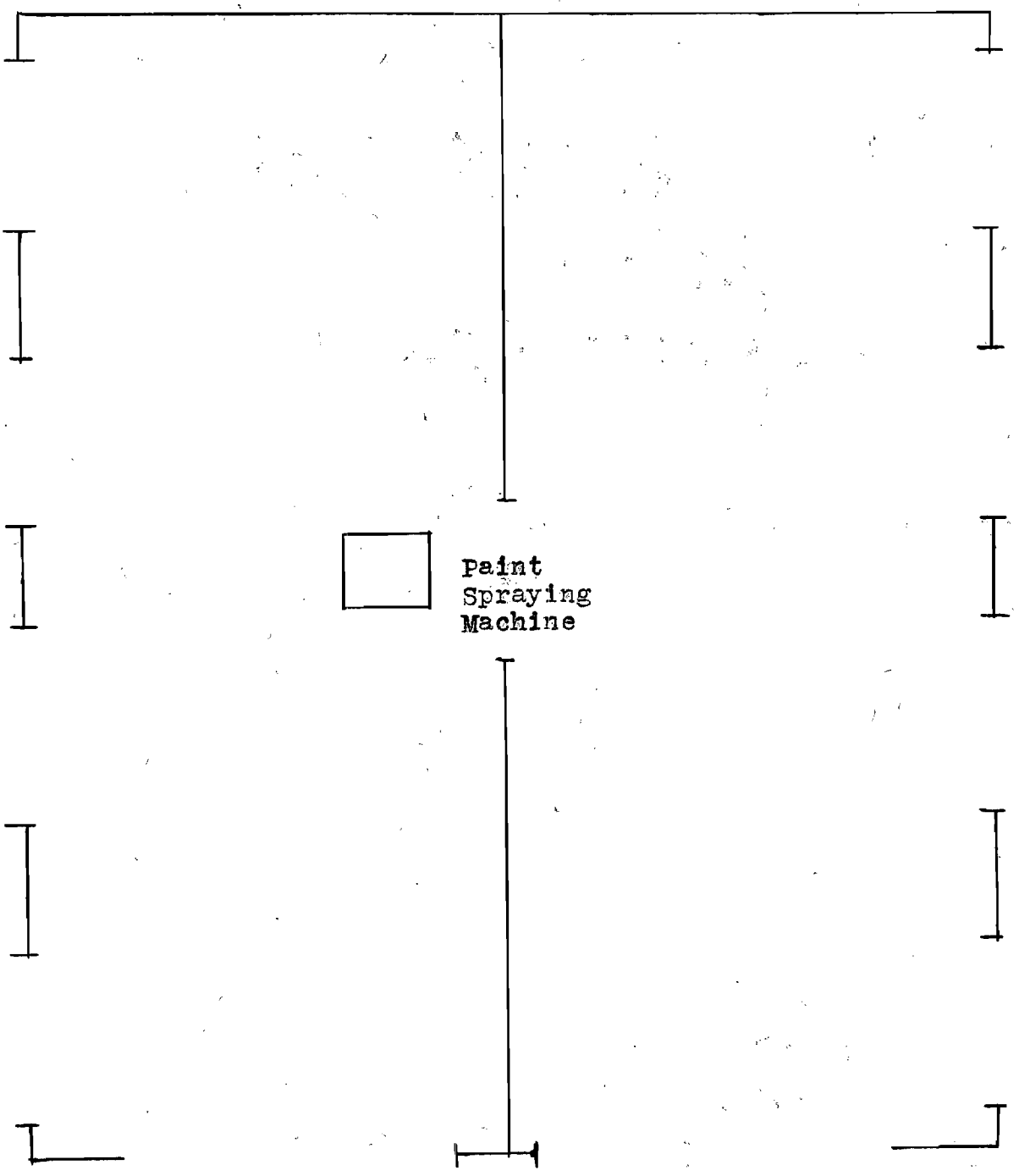

FIGURE 11.

INSTALLATION & TRUCK PAINTING
Scale: 1" to 10'

Space around each machine is ample for processing the varying sizes of raw materials.

The plans show the space occupied by a 12 foot by 7 foot van body; layout of 8 van bodies is shown in both the assembly department and painting department. Space in these departments as well as in the installation department permits the manufacture of bodies 20 feet long.

C. Machinery Requirements.

1. Kinds[21] and Source.[22]

a. Metal Working Equipment

(1) Power Hack Saw: Racine Shear Cut Production Saw, Positive Progressive Screw Feed, 6" by 6" capacity, Model No. 20-C, 2 H.P.; Racine Tool and Machine Company, Racine, Wisconsin.

(2) Bending Brake: Standard Hand Bending Brake, No. 618, 6' 1" length, 18 gauge; Dreis & Krump Mfg. Company, 7400 Loomis Blvd., Chicago, Ill.

(3) Bending Roll: No. 0430, 16 & 18 gauge, 72" Roll; Peckstow and Wilcox, Inc., Southern, Conn.

(4) Metal Shear: No. 172, 6', 18 gauge Shear; Peckstow and Wilcox, Inc., Southern, Conn.

(5) Electric Screwdrivers: Thor Independent Pneumatic Tool Company, Chicago, Ill.

(6) Arc Welding Equipment: Herbert Junior Electric Welding Machine, Model MR-150P, 7.5 H.P., and Accessories;

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[21] Pat Miller, A. C. Miller & Co., Atlanta, Georgia, Interview, June 14, 1946.

[22] Thomas Register of Manufacturers, 1943.

Hobart Brothers Company, Hobart Square, Troy, Ohio.

b. Wood Working Equipment

(1) Swing Cut-off Saw: Heston and Anderson, Fairfield, Iowa. 3 H.P.

(2) Circular Table Saw: No. 9 Cresent Saw Table, 5 H.P., Cresent Machine Company, Leetonia, Ohio.

(3) Planer: Heavy Duty Planer, No. 97, 12", 2 H.P. Parks Woodworking Machine Company, Cincinnati, Ohio.

(4) Jointer: 12" Jointer, 3 H.P. Cresent Machine Tool Company, Leetonia, Ohio.

(5) Shaper: Cresent S-2 Shaper, 2 H.P., Cresent Machine Co., Leetonia, Ohio.

(6) Band Saw: Cresent 32 inch Band Saw; Cresent Machine Company, Leetonia, Ohio, 2 H.P.

c. Painting Equipment

(1) Paint Spraying Machines: 10 H.P., 4 spray guns, Devilbiss Company, Toledo, Ohio.

d. Handling Equipment.

(1) Mono- rail hoists

2. Costs Itemized.[23]

Equipment	No. Required	Price Each	Total
Power Hack Saw	1	$795.	$795.
Bending Brake	1	200.	200.
Bending Roll	1	785.	785.
Metal Shear	1	470.	470.

[23]Approximate costs as of June 1, 1946. Figures obtained by letter from manufacturers, and from manufacturer's agents and representatives in the City of Atlanta, Georgia.

Equipment	No. Required	Price Each	Total
Electric Screw Drivers	12	$ 59.	$708.
Arc Welding Equipment	4	300.	1200.
Swing Cut-off Saw	1	246.	246.
Circular Table Saw	1	530.	530.
Planer	1	250.	250.
Jointer	1	553.	553.
Shaper	1	455.	455.
Band Saw	1	575.	575.
Paint Spraying Machine	2	959.	1918.
MonO-rail Hoists	2	500.	1000.

V RAW MATERIALS

A. Kinds used and Source.

The selection of raw materials for truck bodies is broad enough to permit much variation in their construction. The choice by the manufacturer should be predicated on market demand. From the standpoint of durability and ease in manufacture, as well as marketability, steel has proved to be an excellent raw material. The use of aluminum, though greatly reducing weight, involves a much higher cost as well as additional processing considerations.

"A steel body structure that has been carefully designed in a high strength steel and properly constructed should not only be lighter than a wood framed job but also stronger and more durable."[24]

"For several years there has been a rapid increase in the usage of standard high tensile steel members in the framing of modern truck and trailer bodies. This is being brought about by two important factors. The first is the advantage of standardizing the unit construction details through the use of standard shapes and sections which have been prefabricated by economical mass production methods and designed to simplify the body shop assembly. The second is that designs in steel may be held to more exact limits because the physical properties in manufactured steel can be and are held to very close and uniform tolerances. For this reason the safety factor margin of a design in steel can be held to much lower than that necessary in wood."[25]

Various steel forms are receiving widespread use in the Body Manufacturing business at the present time. Standardized steel shapes and sections such as cross bolsters can be obtained from a number of sources throughout the United States. These standardized steel shapes together with other structural materials such as sheet steel and wood go together to form the

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[24] Nelson E. Cole, Development Engineer, Parish Press Steel Co., "Steel Cross Sill and Mountings", Automotive and Aviation Industries, Nov. 1, 1945, 93:26-9.

[25] Ibid.

essential raw materials of every truck body. A general list of raw materials can be enumerated as follows:[26]

1. Structural Framing.
   a. One inch square, 18 gauge, steel tubing (bent to specification. Source: J. M. Tull, Atlanta, Ga.
   b. One inch square, 18 gauge, steel tubing (straight) 12 foot lengths. Source: J. M. Tull, Atlanta, Ga.
   c. Tapered cross bolsters (sills), 8 feet long. Source: Parish Press Steel Co., Reading, Pa.
   d. Strap iron, 1/16 inch by 1 inch. Source: J. M. Tull, Atlanta, Georgia.
2. Sides and Roof.
   a. 20 gauge cold-rolled steel sheets, 36 inch by 120 inch. Source: Youngstown Sheet and Tube Company, Youngstown, Ohio.
   b. 22 gauge galvanized steel sheeting, 36 inch by 120 inch. Source: Wheeling Steel Company, Wheeling, West Virginia.
3. Internal Lining.
   a. Liner slat sections, 3 inch width, 12 feet long. Source: Parish Press Steel Co., Reading, Pa.
   b. 3/4 inch plywood. Source: Local.
   c. Cork board and seal pad Kraft paper. Source: Local.
4. Flooring.
   a. One inch oak planking. Source: Local.
5. Outside Finish.
   a. Paint. Source: Local.

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[26]Pat Miller, A. C. Miller & Co., Atlanta, Georgia, Interview, May, 1946.

6. Accessories.

a. Hinges.

b. Locks.

c. Lighting Fixtures.

d. Tailgate Chains.

e. Rear Step.

B. Transportation.

1. Facilities.

The many rail facilities which serve the Atlanta area were discussed in Chapter III. The main line under consideration, however, is the Seaboard Airline Railway since this railway serves the chosen plant site.

2. Estimated Costs.

The majority of raw materials that are not obtained locally can be obtained from manufacturing plants in Ohio, West Virginia, and Pennsylvania. The rate for rail shipment from these areas to Atlanta is approximately 64¢ per 100 pounds for all types of steel raw materials.[27] Using this basic figure, the freight charge for the various structural members which form a truck body can be calculated. This charge can be easily calculated if it is only desired to know the cost of freight per car load lot. However, much more interesting figures can be obtained by calculating the approximate quantity and weight of steel sections that will be required by one average size truck body (a 12 ft. by 7 ft. by 6 ft. van body can be used as typical) and from these weight figures calculate the approximate freight cost per body. The approximate freight costs for the different

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[27]Seaboard Freight Office Quotations, Atlanta, Ga., June, 1946.

structural members that comprise one average body may be listed as follows:[28]

Item	Approximate Freight
U Frames	$0.80
Cross bolsters	0.75
Longitudinal frames	0.64
Liner slat sections	1.00
Sheet steel sides	3.75
Sheet steel roof	2.25

[28]Pat Miller, A. C. Miller & Co., Atlanta, Georgia, Interview, June 1946. (These figures were calculated from weights and material estimates supplied by A. C. Miller & Co.)

VI WATER, POWER, LIGHT, AND HEAT REQUIREMENTS

A. Power.

The total power required to operate all machinery in the plant continuously can be calculated by obtaining a summation of all the horsepower requirements of the various machinery listed in Chapter IV, and converting these horsepower requirements to kilowatts. On the basis of one horsepower equals 746 watts[29] (.746 kilowatts), the plant requirements will be 36 kilowatts per hour or 288 kilowatt-hours per day. Assuming a "load factor" of five-tenths (.5), the normal power requirements would be 144 kilowatt-hours per day or 3312 kilowatt-hours per month.

B. Lights.

Adequate lighting is a very important aspect of plant layout and should be carefully considered in designing a new plant. A thorough analysis of the lighting needs, however, is beyond the scope of this thesis and should be presented as a problem for an illumination Engineer. Taking into consideration such factors as ceiling height, floor area, window area, and working conditions, it seems reasonable to assume that a lighting load of 50 kilowatts per hour or 9200 kilowatt-hours per month will be required for a plant having dimensions as sketched in Chapter IV.

C. Water.

The water requirements of a Body Manufacturing plant will be limited to the needs of shop personnel, and for washing truck chassis and general cleaning.

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[29] Chester L. Dawes, Electrical Engineering, Vol. 1, Direct Currents. New York: McGraw-Hill Book Co., Inc., 1937, p. 44.

D. Heat.

Heat requirements for a typical plant will vary over a considerable range depending on several factors such as insulation properties of the building, wall and ceiling area, window area, door area, desired inside temperature, and the average or prevailing outside temperature. Accurate calculation of such a heating condition would be a problem for a Heating or Insulation Engineer. However, it is reasonable to assume, on the basis of similar constructions, that $600 should about cover the needs of a normal winter in Atlanta. Office temperature should be maintained at 68 to 70 degrees, but shop temperature may be somewhat lower.

E. Costs.

The rate chart for industrial power consumption in a plant of this type may be quoted as follows:[30]

1st 20 kilowatt-hours	$1.11	(minimum bill)
Next 80 kilowatt-hours	4.44¢ per	Kw-hr.
Next 1400 "	3.33¢ "	"
Next 3000 "	2.77¢ "	"
Next 5500 "	2.22¢ "	"
Next 10000 " and over	1.66¢ "	"

The total lighting and power requirements for one month is 12,512 kilowatt-hours, which represents a cost of $207.75 at a rate of 1.66¢ per kilowatt-hour.

Total overall yearly costs of power, heat, light, and water for a

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[30]Georgia Power Rate Chart for Industrial Power, June 1946.

plant of the size under consideration may be listed as follows:

Power and Lights	$2493.05
Water	480.00
Heat	600.00
Total	$3573.05

VII DESCRIPTION OF PROCESSING

A. Steps.

The manufacture of motor truck bodies involves four main steps or processes[31]------ prefabrication, assembly, painting, and installation. By way of illustration, and in order to formulate a clear presentation of these processes, the sub-sections which follow outline in detail the various steps involved in the manufacture of a Van Type Body.

1. Prefabrication.

The prefabrication process includes all the operations necessary to prepare the raw materials listed in Chapter V for assembly by the assembly department. Upon receipt of an order for a given type of body having given specifications, the Prefabricating Department will perform operations as follows:

a. Prefabricate structural frames.

(1) Select proper width transverse "U" frames from stock of one inch, 18 gauge, steel tubing (bent) and cut to correct length.

Machinery: Power hack saw.

(2) Cut to specifications, necessary quantity of longitudinal frames using one inch square steel tubing (straight).

Machinery: Power hack saw.

(3) Cut tapered cross bolsters (sills) to proper length.

Machinery: Power hack saw.

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[31]Pat Miller, A. C. Miller & Co., Atlanta, Ga. (The general procedure as here outlined is in accord with the methods used by A. C. Miller & Co; the specific division of the various processes into steps is the plan of the author).

(4) Cut to length and bend to required shape, required number of pieces of 1/16 inch by 1 inch strap iron to be used on corners.

b. Prefabricate Sides and Roof.

(1) Cut necessary sections of 22 gauge, galvanized steel sheeting and bend to proper shape (using template) to form the roof.

Machinery: Metal shear; bending roll.

(2) Cut necessary sections of 20 gauge cold rolled steel sheet to form the sides. (Also, door if specified)

Machinery: Metal shear; bending roll.

c. Prefabricate Internal Lining.

(1) Cut to length the necessary quantity of liner slat sections.

Machinery: Power hack saw.

(2) In the event that plywood lining is specified instead of liner slat sections, cut to specifications the necessary number of plywood sections.

Machinery: Circular table saw.

d. Prefabricate Flooring.

(1) Cut smooth finish on rough oak lumber.

Machinery: Planer

(2) Cut sections of lumber to proper length.

Machinery: Swing Saw.

(3) Rabbet edges of the lumber so that it can form ship-lap joints.

Machinery: Jointer or shaper.

2. Assembly.

The prefabricated sections are turned over to the assembly department to be assembled. These prefabricated parts, along with standard stock items drawn from stores will form the final truck body. The steps in assembly may be listed as follows:

a. Assembly of structural frames.

(1) The tapered cross bolsters (sills) are set in a jig and butt welded to the transverse "U" frames. (See Figure 12). The welding technique used in the welding of cross sills at or near the reaction point is very important.

> "Some high tensile steels lose a great share of their strength at the point of weld when subjected to welding heats. To weld across a section is the same as reducing the strength by cutting across the section. Because of this all weld lines should be parallel with the running length of the cross sill, or directly across the cross sill bearing angle or channel."[32]

(2) The longitudinal frames are installed as per print and are butt welded to the transverse "U" frames to form the main skeletal structure of the body.

(3) The formed sections of strap iron are fitted in place and welded to form the corners.

b. Assembly of Sides and Roof.

(1) The 20 gauge cold rolled steel sheets which form the sides are tack welded in place and secured with steel self-threading machine screws. These screws are driven with electric screwdrivers.

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[32]Nelson E. Cole, Development Engineer, Parish Press Steel Co., "Steel Cross Sills and Mountings", Automotive and Aviation Industries, Nov. 1, 1945, 93:26-29.

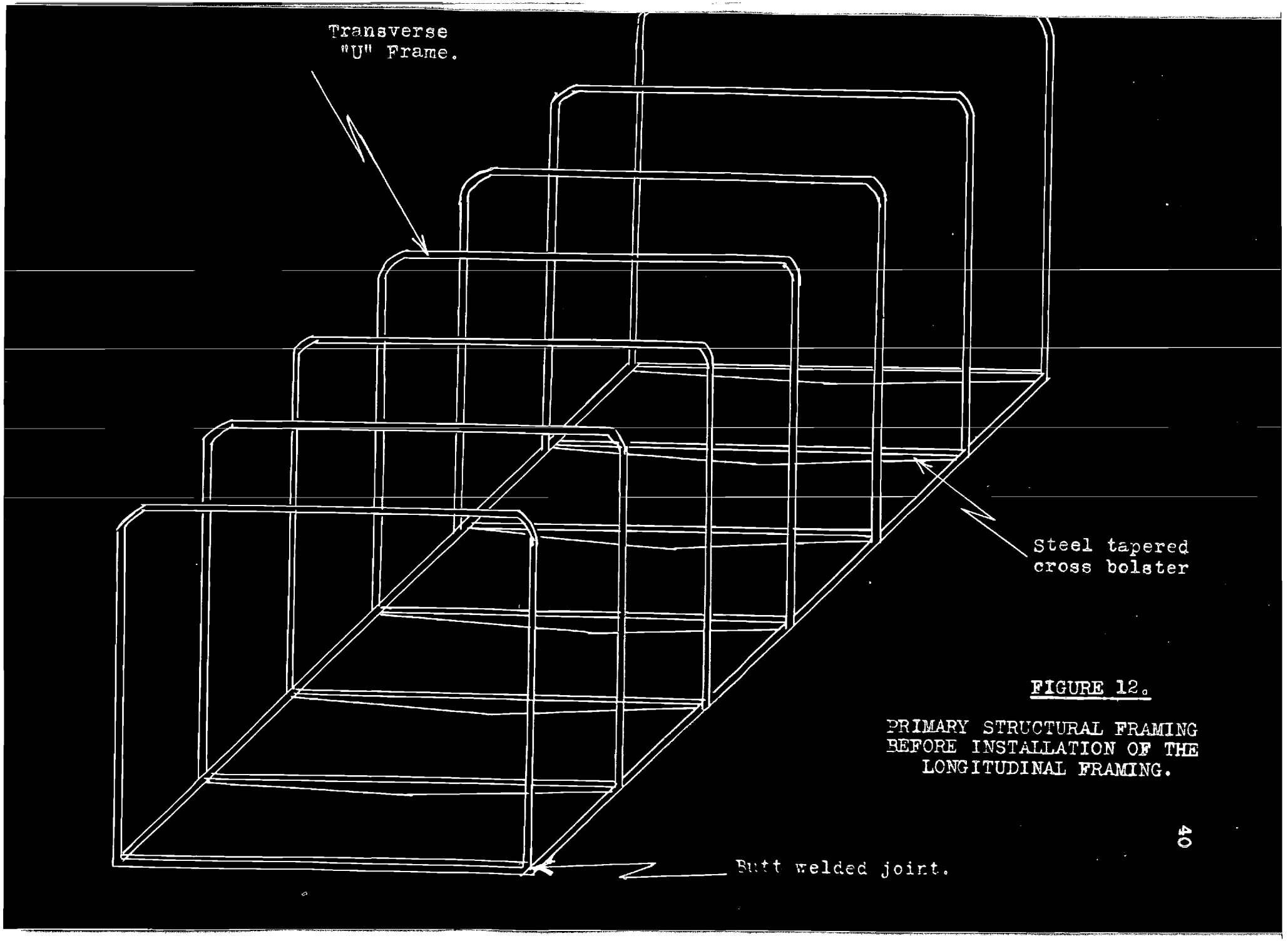

FIGURE 12.

PRIMARY STRUCTURAL FRAMING BEFORE INSTALLATION OF THE LONGITUDINAL FRAMING.

(2) The 22 gauge galvanized steel sheeting which forms the roof is fitted in place and secured with steel self threading screws. The individual sections which form the roof are crimped together in such a way as to form a water tight joint when the crimped joint is soldered together.

c. Assembly of the Internal Lining.

(1) If liner slat sections are used, they are secured to the transverse "U" frames by means of steel, self-threading machine screws. These slats start at the floor level and are spaced at six inch intervals to the ceiling (roof).

(2) If plywood is used to line the body it is fitted to the sides and ceiling and secured in place by screws.

d. Assembly of the Flooring.

(1) The one inch oak flooring which has been rabbeted is fitted together and secured in place.

e. Assembly of Accessories.

(1) The hinges for doors or tailgate are secured in place.

(2) Rear step (if specified) is welded in place.

(3) Doors or tailgate are assembled from prefabricated parts.

(4) Locks are installed on doors as necessary.

(5) Tailgate chains are installed if necessary.

(6) Lighting fixtures are installed. (In case of plywood lining, the lighting connections (wiring) should be installed prior to the installation of the plywood).

3. Painting.

Painting is a very important aspect of Body Manufacturing, since

the paint job has great influence over the final appearance of the body. A good paint job is not only an asset to the Body Manufacturer who will sell more bodies if they are attractively painted, but is also of high advertising value to the customer or truck user. "The use of ivory colored bodies has high advertising value in the Bakery business."[33] Neat, clean, attractively painted bodies will have similar value in other businesses as well.

The completely assembled bodies are moved from the assembly department to the painting department by means of overhead mono-rail hoists. The bodies are set on foundation stands in the painting department and operations are performed as follows:

a. Cleaning Procedure.

(1) All grease and dirt must be removed from all metal surfaces.

(2) Wood surfaces are sanded smooth where necessary and carefully cleaned.

b. Preparation.

(1) A metal primer coat is applied to all metal surfaces.

c. Painting.

(1) Two coats of paint as specified is applied to all metal surfaces.

(2) Lettering and advertising print as specified is applied.

(3) Floors and walls are stained and varnished.

4. Installation and Truck Painting.

The trucks on which the bodies are to be installed are painted in accordance with customer's specifications. The finished bodies are

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[33] Food Industries, Dec. 1939, "Attractive Trucks Build Business".

moved from the painting department to the installation department by means of an overhead mono-rail hoist and are installed on the newly painted truck chassis. Bodies are aligned on truck chassis and secured to the truck frames by means of "U" bolts. Truck may drive away with completed body.

5. Quality Control.

A rather recent and important aspect of modern manufacturing is quality control. In its broadest sense quality control refers to the systematic control of the various variables involved in a manufacturing process which in any way affect the excellence of the finished product.

> "Any quality control program relies on inspection together with reporting, collecting, sorting, and analyzing of inspection results to indicate wherein a lack of quality control exists. Such a program generally embraces four separate phases: 1. Inspection which segregates defective goods so as to insure that the customer receives only goods of adequate quality; 2. Inspection designed to locate flaws in the raw material or in the processing of that material which will cause trouble at subsequent operations; 3. Investigation of inspection results so as to locate those points in the manufacturing process at which control is breaking down; and 4. The correction or salvaging of material rejected during the manufacturing process."[34]

As in other manufacturing processes, quality control should be an important feature of the body manufacturing business. Every man in the organization should be required to maintain a high quality level in his work. Superintendents and foreman should be on the look-out at all times for poor workmanship and special training should be given where needed. The aim should always be at "prevention" rather than at a belated "cure". The inspection gang, under cognizance of the Works Manager, should make inspections of all parts, assemblies, and finished

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[34] L. L. Bethel, Industrial Organization and Management, New York: McGraw-Hill and Co., 1945, pp. 376-377.

products to insure first class workmanship throughout. Great effort should be exercised to correct small defects early in the process and thus avoid larger defects in the finished product.

B. Time Required in Process.

In Chapter IV a suggested factory and machinery layout was described that is capable of producing around 90 bodies a month. Assuming the availability of the maximum number of personnel that can be used efficiently, this plant set-up will require six days to completely process one truck body. The time in process may be broken down as follows:

1. Prefabrication: Time required - 1 day.
2. Assembly: Time required - 2 days.
3. Painting: Time required - 2 days.
4. Installation & Truck Painting: Time required - 1 day.

C. Production Schedule.

The suggested plant layout has been so arranged that a maximum production of around 90 bodies per month can be maintained. Assuming a five day work week, a production schedule of four truck bodies per day will be adequate to supply the monthly maximum. In order to maintain this schedule, considering that the time in process is six days it will be necessary to have twenty-four bodies in process at any one time. These bodies in process will be distributed throughout the various departments as follows:

1. Prefabrication: Parts for four bodies must be prefabricated daily.
2. Assembly: Assembly work will be performed on eight bodies simultaneously. Four bodies will be completed daily.

3. Painting:	Painting and cleaning operations will be performed on eight bodies simultaneously. Four bodies must be completed daily.
4. Installation:	Four trucks must be painted daily, and four bodies must be installed.

VIII MANAGEMENT AND LABOR

A. Organizational Structure[35] (General Considerations)

1. Initial Considerations.

In setting up a plan of organization for a truck body building company, or any company for that matter, there are certain initial or fundamental concepts which should be thoroughly understood. These fundamentals are policies, authorities, responsibilities, and duties; though each is simple in its basic definition, it is imperative that these items be clearly set forth in the organizational structure. In dealing with the "human equation" it is always wise to set forth clear cut policies, to make definite lines of authority and responsibility, and to carefully enumerate and explain duties. Nothing should be left to the imagination as inefficiency, misunderstanding, and general confusion will result. Though organization in its broadest scope, involves five main topics, the essence of organization in the last analysis involves only two main concepts ---"the job" and "the man". It should be the duty of the organizer to form his organizational structure around these concepts.

2. Selection of a Basis for Departmentalization.

There are four methods at present in general use to departmentalize a business organization; the important problem is to select the basis best fitted to the circumstances so that the various departments can be effectively supervised and coordinated. The basis in common use are area, product,

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[35] L. P. Alford, "Plant Organization", Production Handbook, New York: The Ronald Press Co., 1946, pp. 1-63.

process, and functionalization. In the manufacture of truck bodies, three of the methods of departmentalization can be effectively utilized. Within the sales organization, assuming it reached reasonable proportions, departmentalization could best be effected on an area or territory basis, each salesman covering a designated sector of the southeast. In the manufacturing department, the basis of departmentalization would be process; the shop organization would be made up of foremen in charge of single steps in the manufacturing procedure. In the overall organization, the departmentalization would be based on "functionalization", a method wherein managerial functions are grouped according to kinds of duties. Since a body manufacturing company only produces many different types of one product, there is no necessity for product departmentalization.

3. Selection of a Type of Organization.

In general, the details of organizational structure vary with the different needs of a given enterprise, just what form will prove best for a given company depends upon its objectives, the caliber of men available, and the particular conditions under which they work. There are five principal organizational types in common use: line or military, line and staff, functional (pure), line and functional staff, and line, functional staff, and committee; the advantages and disadvantages of each can be readily obtained from any good Management Text Book or Handbook. Most large corporations today have a line, functional staff, and committee form of organization. This type is generally used where large numbers of personnel are employed and where the need for cooperative relationships throughout the organization becomes more apparent. The use of functionalized staff departments gains many of the advantages of both the line and staff, and the

functional type of organization. The line and functional staff is supplemented by a committee or network of committees formed for the performance of special duties.

The organizational chart, Figure 13 is representative of the type of organization employed by a typical manufacturing company. The organization of shops under the factory superintendent is typical of a truck body building concern. This organizational chart indicates the duties and responsibilities of the various departments in the company; its type is essentially line and functional staff, which readily permits the addition of committees. The chart, Figure 13, may be used for truck body building companies of varying sizes, from the largest to the smallest. However, it must be remembered that the chart is not intended to indicate the number of management personnel employed; its primary purpose is to indicate "functions" or "jobs" to be performed, and the relationships between these functions. It must be understood that a small or medium sized concern, such as we are concerned with here, could not possibly support such a tremendous "fixed cost" in superintendents. It may be necessary to eliminate certain functions in some cases, and in other cases one executive or superintendent may have to supervise several departments. In the beginning stages of a small company it may be necessary for the president to supervise several departments and to employ one good shop foreman to occupy the position of production manager. Under such conditions the organizational structure or type is changed. However, the important thing is to recognize the various jobs to be performed and to fit the available personnel into the jobs in a manner that will result in the greatest efficiency for the existing situation.

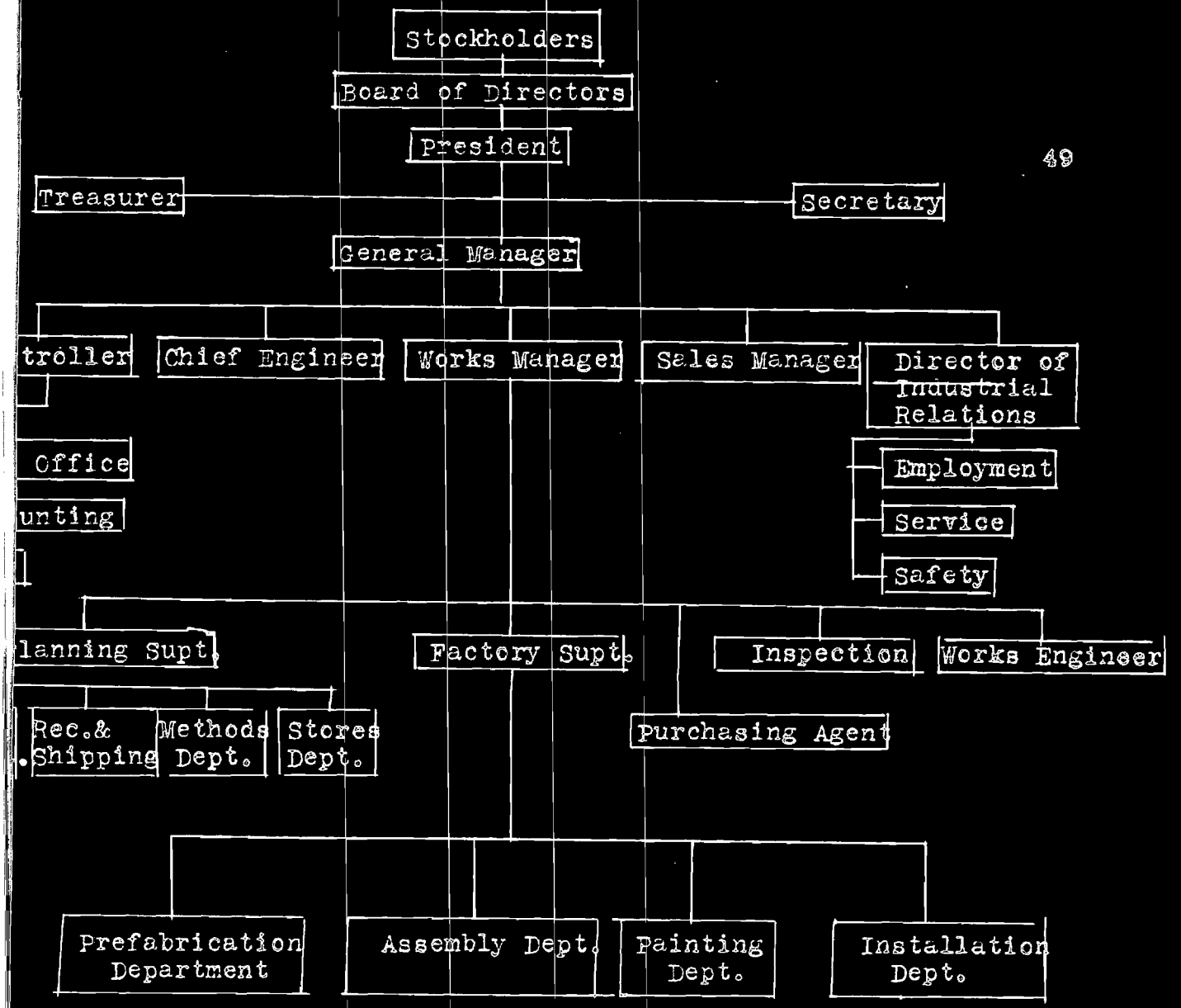

FIGURE 13.

ORGANIZATIONAL CHART OF A TYPICAL MANUFACTURING COMPANY.

4. Principal Subdivisions.

The size of the enterprise determines the subdivisions. However, in all organizations two main subdivisions are recognized, the Management Section and the Operating Section. In a small company it will be necessary for the Management Section to perform duties usually handled by the Operating Section.

The Operating Section is usually divided into five divisions reporting to an executive vice-president or general manager. Each division may be organized into departments with their designated heads, these departments being arranged according to function. The usual divisions of the Operating Section are internal finance and office service, sales, industrial relations, manufacturing, and product development.

B. Organizational Structure (Specific Considerations).

Figure 14 shows the organizational structure suggested for a medium sized Body Manufacturing Plant. The various main functions are indicated in the blocks, and it will be noted that one man very often is required to perform more than one function. For instance, the President of the company will act as General Manager, Chief Engineer, and Sales Manager as well as perform his duties as President. The Vice-President will serve as Works Manager in addition to his regular duties. The Secretary and Treasurer will act as Comptroller and as Personnel Officer.

The organizational structure is essentially line and functional staff. The number of men in each department is clearly indicated. Lines of authority and responsibility are clear cut. The duties of each workman in

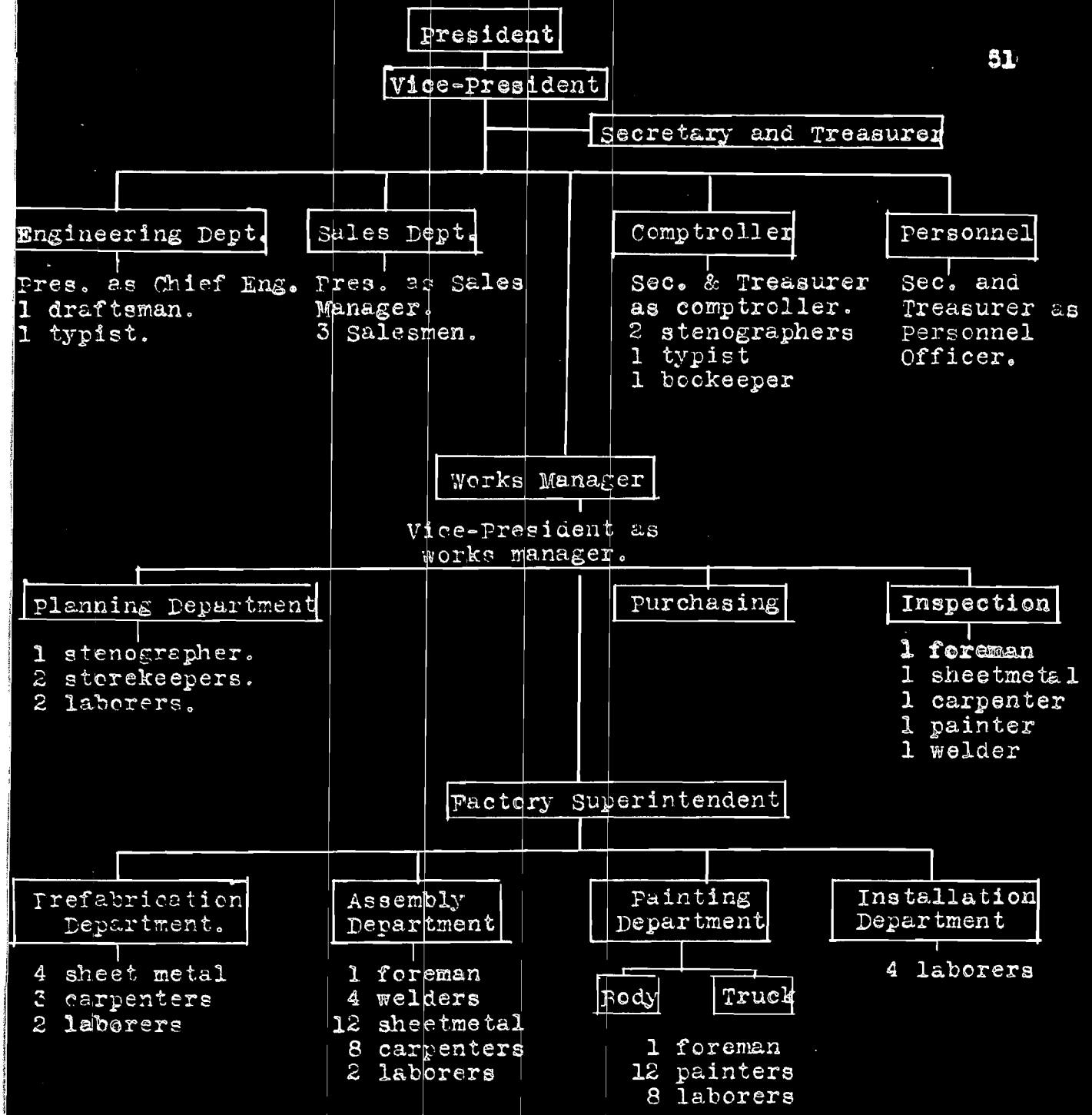

FIGURE 14

ORGANIZATIONAL CHART FOR A MEDIUM SIZED BODY BUILDING COMPANY.

the organization are self-explanatory; they perform the functions of their respective trades and follow the general procedure listed in Chapter VII.

C. Salary and Wage Rates.

Wage rates for the various trades involved in the manufacture of truck bodies may be listed as follows:[36]

Trade	Prevailing Rate	Union Shop
Painters	$1.25 per hour	$1.37½ per hour
Carpenters	1.25 per hour	1.37½ per hour
Welders	0.90 per hour	1.00 per hour
Sheet Metal Workers	1.00 per hour	1.37½ per hour

These figures represent the approximate wage rates for a first class worker in each of the listed trades. Workers in the common laborer class will receive approximately 65¢ per hour. Contact with the firm of A. C. Miller & Co., Atlanta, Georgia has indicated a wage rate varying from 90¢ per hour to $1.25 per hour.

D. Availability and Supply of Labor.

The types of labor required for a truck body manufacturing company are readily available at the present time.[37] The U. S. Employment Service can easily supply the demands of a medium sized body plant similar to the one under discussion.

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[36] United States Employment Service, Atlanta, Ga., June 1946.
[37] Ibid.

IX SALES ORGANIZATION

A. Plan.

The sales organization should be departmentalized on an area or territory basis. The sales area, Georgia, Florida, Alabama, South Carolina, North Carolina, Tennessee, and Kentucky can be conveniently divided into three zones, each zone being covered by one salesman. Zones can be arranged as follows:

Zone 1. Georgia and Florida

Zone 2. Alabama, Tennessee, and Kentucky

Zone 3. South Carolina and North Carolina

Salesmen should travel their assigned zones contacting prospective customers in the principal cities of each zone. Special effort will be exerted on the companies which maintain fleets of trucks, as several large accounts with fleet owners will assure a steady volume of sales.

Salesmen should also contact truck dealers and truck salesmen in the various cities of their zone in an effort to spread goodwill and advertise the Body Building Company. Purchasers of new trucks are very often guided in their selection of a Body Company by the truck salesmen.

B. Salesmen.

Salesmen should be familiar with both trucks and truck bodies. Their knowledge of body design and capacity as well as adaptability should be faultless. In dealing with customers who have special problems or customers who may desire certain special features in body design, they should have such knowledge of the body plant and its capacity as is necessary to make reasoned decisions. Salesmen should maintain close contact with the plant office in order to keep the plant informed of recent sales and to obtain

information on production schedules.

Salesmen will act as the direct representatives of the company in making contracts and will see that the production department is informed of all customer specifications, especially with reference to the truck and body paint jobs.

Salesmen should be compensated on a salary and commission plan. A quota system should be devised whereby the salesmen receive a basic salary of $200.00 per month and an additional 5% commission on all sales above $7500.00. An additional $200.00 per month should be allowed for traveling expense.

X PRICE AND PRICING

A. Average Variable Cost.[38]

The first step in price setting is the calculation of the "average variable cost". This cost is made up of two main factors, raw materials and labor, and may be itemized as follows:

1. Raw Materials.

The approximate cost of material in a typical truck body of the van type (12 ft. by 7 ft. by 6 ft.) may be listed as follows:

U Frames	$14.00
Cross bolsters	13.30
Longitudinal frames	11.00
Oak flooring	6.30
Liner slat sections	17.50
Tail gate, hinges and chain	10.25
Sheet steel sides allowing	
20% waste	30.30
Sheet steel top allowing	
20% waste	16.56
Paint (truck and body)	15.00
Lights	3.00
Total	$137.21
Freight	10.00
	$147.50

2.

[38]Pat Miller, A. C. Miller & Co., Interview, July 1946.

2. Direct Labor (approximately 125 man hours)	$138.00
3. Total Average Variable Cost	$286.00

B. Average Fixed Cost.

The second step in price setting is to calculate the average fixed cost. This cost may be summarized as follows:

1. Manufacturing Expenses:

Indirect labor	$11.74
Superintendence	12.70
Maintenance and repairs	.50
Heat, light, and power	3.20
Property taxes	2.00
Depr. of machinery and equipment	1.30
Depr. of building	2.40
Factory supplies	1.00
	$34.84

2. Operating Expenses:

Sales expense	$18.00
Traveling expense	6.50
Advertising	1.60
	$26.90

3. General Expense:

Office Salaries	$14.10
Officers Salaries	23.60
Depr. of office equipment	0.40
Office supplies	0.50
	$38.60

4. Other Expense:

Interest Cost	$ 5.60
Estimated Income Tax	18.10
	$23.70

C. Average Total Cost:

The average total cost is the sum of the average fixed cost and the average variable cost. This may be listed as follows:

Average Variable Cost	$286.00
Average Fixed Cost	124.00
Average Total Cost per body	$410.00

In order to obtain a reasonable profit from the anticipated sales and keep within the price range permitted by the market, a selling price of $450 is suggested as the minimum for the type of body under discussion. More elaborate and larger bodies will have a proportionally higher price. Smaller bodies will have a lower price.

XI ACCOUNTING

A. Sample Balance Sheet[39] Year Ending December 31, 1946

(Beginning of First Year Operations)

ASSETS

CURRENT ASSETS:			
Cash		25000	
Accounts Receivable	0000		
Less Reserve for bad debts	0000	0000	
Inventories:			
Finished Goods	0000		
Goods in process	3600		
Raw Material	40500	44100	
Total Current Assets			69100
FIXED ASSETS:			
Office Equipment	4000		
Less reserve for depr	400	3600	
Machinery and Equipment	9685		
Less Reserve for depr	1453	8232	
Buildings	88500		
Less Reserve for depr	2655	85845	
Land		10000	
Total Fixed Assets			107677
DEFERRED CHARGES TO EXPENSE:			
Factory Supplies		1000	
Office Supplies		500	
Prepaid Insurance		600	
Total Deferred Charges to Expense			2100
Total Assets			178877

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[39] J. O. McKinsey, Accounting Principles, Cincinnati, Ohio, 1939, p. 559.

LIABILITIES

CURRENT LIABILITIES:

Accounts Payable.....	0000	
Wages Payable.....	0000	
Interest Payable.....	0000	
Provision for Federal Income Tax.....	10377	
Total Current Liabilities.....	10377	

FIXED LIABILITIES:

First Mortgage 7 percent Bonds Payable.....	88500	
Total Liabilities.....		98877

PROPRIETORSHIP

Capital Stock	80000	
Surplus	0000	80000

B. SAMPLE STATEMENT OF PROFIT AND LOSS[40]

(Year Ending December 31, 1947)

INCOME FROM SALES:			
Gross Sales		496800	
Less Sales returns and allowances		1800	
Net Sales			495000
COST OF GOODS SOLD:			
Finished Goods Inventory, Jan. 1, 1947		0000	
Cost of Goods Manufactured (Sch. #1)		352801	
Total Cost of Fin. Goods Avail. for Sale		352801	
Less fin. goods Inventory, Dec. 31, 1947		000000	
Cost of goods sold			352801
Gross Profits on Sales			143199
OPERATING EXPENSES:			
Selling Expense:			
Sales Salaries and Commissions	20700		
Traveling Expense	7200		
Advertising Expense	1776	29676	
GENERAL EXPENSES:			
Officers Salaries	26000		
Office Salaries	15600		
Depr. of Office Equipment	400		
Office Supplies Used	500	42500	
Total Operating Expenses			72176
Net Profit from Operations			71023
OTHER EXPENSE:			
Interest Cost			6195
Net Income before Provision for Federal Income Tax			64828
Less provision for income Tax			20000
NET INCOME			44828

[40] J. O. McKinsey, op. cit., p. 557.

C. SAMPLE SCHEDULE NO. 1. COST OF GOODS MANUFACTURED[41]

(For Year Ending December 31, 1947)

GOODS IN PROCESS INVENTORY:			
Dec. 31, 1946			3600
RAW MATERIALS:			
Inventory, Dec. 31, 1946		40500	
Purchases		162000	
Total Cost of Material Available for use		202500	
Less Inventory, Dec. 31, 1947		40500	
Cost of Materials Consumed		162000	
DIRECT LABOR		152712	
MANUFACTURING EXPENSES:			
Indirect Labor	12960		
Superintendence	13948		
Maintenance and Repairs	500		
Heat, Light, Water, and Power	3573		
Property Taxes	2000		
Depr. of Machinery and Equipment	1453		
Depr. of Building	2655		
Factory supplies used	1000	38089	
Total Cost of Manufacturing			352801
Total goods in process during period			356401
Less goods in process, Dec. 31, 1947			3600
Cost of Goods Manufactured			352801

[41] J. O. McKinsey, op. cit., P. 558.

D. SAMPLE BALANCE SHEET[42] - (Year Ending December 31, 1947)

ASSETS

CURRENT ASSETS:			
Cash		69828	
Accounts Receivable	0000		
Less Reserve for bad debts	0000	0000	
Inventories:			
Finished goods	0000		
Goods in process	3600		
Raw Material	40500	44100	
Total Current Assets			113928
FIXED ASSETS:			
Office Equipment	3600		
Less Reserve for depr	400	3200	
Machinery and Equipment	8232		
Less Reserve for depr	1453	6779	
Buildings	85845		
Less Reserve for Depr	2655	83190	
Land		10000	
Total Fixed Assets			103169
DEFERRED CHARGES TO EXPENSE:			
Factory Supplies		1000	
Office Supplies		500	
Prepaid Insurance		600	
Total Deferred Charges to Expense			2100
Total Assets			219197

[42] J. O. McKinsey, op. cit., p. 559.

LIABILITIES

CURRENT LIABILITIES:		
Accounts Payable	0000	
Wages Payable	0000	
Interest Payable	0000	
Provisions for Federal Income Tax	20000	
Total Current Liabilities	20000	
FIXED LIABILITIES:		
First Mortgage 7 percent Bonds Payable	88500	
Total Liabilities		108500

PROPRIETORSHIP

Capital Stock	80000	
Surplus	30697	
Total Proprietorship		110697

XII SAMPLE CHARTER[43]

Georgia, Fulton County.

To the Superior Court of said County.

The petition of _____, _____, and _____ shows to the court.

1. That they desire for themselves, their associates, successors, and assigns to be incorporated under the name and style of _____ for a period of 20 years with the privilege of renewal as provided by law.

2. That the capital stock of said corporation is to be $ 80,000 divided into shares of the par value of $100.00 each.

3. That said capital stock may, at any time, by a majority vote of the stockholders then entitled to vote, be increased to any sum not in excess of $250,000.

4. The object of said corporation is pecuniary gain to its stockholders.

5. The particular business to be carried on by said corporation is that of manufacturing motor truck bodies and furnishing all the accessories therefor. In addition to the doing of the things hereinbefore enumerated, petitioners desire that said corporation shall have the right to buy, sell, exchange and deal in automobiles, trucks, trailers, or accessories therefor, either as agents, dealers, or distributors.

6. Petitioners further desire that said corporation shall have the right to advance or lend money when necessary to the conduct or performance of the business which said corporation may be authorized to carry on and to have and take any form of lien or security therefor authorized by law; to own, sell, lease, and improve real estate; to borrow money and secure the same by mortgage, loan deed, trust deed, or other form of security, and to own, buy, sell and exchange any properties necessary or useful to said corporation in carrying out the purposes for which it is to be incorporated.

7. The minimum capital stock of said corporation is to be paid in at the time said corporation is organized and before it begins business, as such, and the same is to be paid for in cash or in properties useful and necessary to the purposes of said corporation and at a fair evaluation.

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[43]Similar to Charter for A. C. Miller & Co., (Office of the Clerk of the Superior Court, Atlanta, Georgia).

8. That said corporation shall have the right to contract and be contracted; to sue and be sued as a body corporate; to have and use a common seal and to adopt by-laws and rules for the government and conduct of the business of said corporation not inconsistent with the laws of the State of Georgia.

9. The principal office and place of business of said corporation is to be in Atlanta, Georgia, Fulton County, but petitioners desire that said corporation may establish branch factories, offices, or agencies in the State of Georgia, or the United States.

Wherefore petitioners pray to be incorporated under the name and style as aforesaid, with the powers, privileges, and immunities herein set forth and such as are now or hereafter may be allowed to similar corporations under the laws of the State of Georgia.

_____

Attorney at Law.

Date:

EX PARTE:

Application of _____, _____, _____ of Fulton County, Georgia for Incorporation as _____.

_____, _____, and _____ of Fulton County, Georgia having filed in the office of the Clerk of the Superior Court of Fulton County, Georgia their foregoing petition seeking the formation of a corporation to be known as _____ and having complied with all the requirements of law in such cases made and provided, and the court being satisfied that said application is legitimately within the purview and intention of the Code and Laws of the State of Georgia, and the same is hereby granted and the above named persons, their associates, successors and assigns are hereby incorporated for the term of 20 years with the privilege of renewal at the expiration of time under the corporate name of

_____

for the purposes in said petition set forth and with all the rights, powers and privileges therein prayed for.

_____
Judge

XIII SAMPLE BY-LAWS [44]

Article 1. Stockholders Meetings

1. The Annual Meeting of Stockholders shall be held in the principal office of the company in Atlanta, Georgia on the third Monday in January of each year at 9 A.M. if not a legal holiday, but if a legal holiday, then on the next business day following.

2. Notice of the Annual Meeting and of every special or adjourned meeting of stockholders, written or printed, shall be prepared and mailed to the last known post-office address of each stockholder not less than ten days before any such meeting, and if a special meeting, such notice shall state the object or objects thereof. No failure of or irregularity of notice of any annual meeting shall invalidate such meeting or any proceding thereat.

3. Special meetings of the stockholders shall be called at the principal office of the company at any time by resolution of the Board of Directors or upon written request of the stockholders holding one third of the outstanding stock.

4. Voting at any Meeting of stockholders may be in person or by a written proxy, duly signed but requiring no other attestation.

5. A Quorum at any meeting of the stockholders shall consist of a majority of the outstanding voting stock of the Company, represented in person or by proxy. When a quorum is present at any meeting, a majority of the voting stock thereat shall decide any question that may come before the meeting. In the absence of a quorum those present may adjourn the meeting to a future date, but until a quorum is secured, may transact no other business.

6. The Presiding Officer of Stockholders meetings shall be the President, when present. In his absence, the next officer in due order who may be present shall preside. The due order for the purposes of these by-laws shall be President, Vice-president, and Treasurer.

7. The Election of Directors shall be held at the annual meeting of stockholders, and shall, after the first election, be conducted by two inspectors of election, appointed by the President for that purpose. The election shall be by ballot and each holder of record of voting stock shall be entitled to cast one vote for each share of stock held by him.

8. The Order of Business at the annual meeting, and as far as possible, at all other meetings of the stockholders, shall be:

(1) Calling the roll.
(2) Proof of due notice of the meeting.
(3) Reading and disposal of any unapproved minutes.

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[44] Thomas Conyngton, Corporation Procedure, New York: The Ronald Press, 1922, pp. 1196-1199.

(4) Annual report of officers.
(5) Election of Directors.
(6) Unfinished business.
(7) New business.
(8) Adjournment.

Article 2. Board of Directors

1. The Business and Property of the Company shall be managed by a Board of four directors who shall be holders of record of at least one share of stock of the Company and who shall be elected annually by ballot by the stockholders for the term of one year, and shall serve until the election and acceptance of their duly qualified successors. Any vacancies may be filled by the Board for the unexpired term. Directors shall receive no compensation for their services as such.

2. The Regular Meetings of the Board of Directors shall be held in the principal office of the Company in Atlanta, Georgia on the second Tuesday of each month at 1 P.M., if not a legal holiday, but if a legal holiday, then on the next business day following.

3. Special Meetings of the Board of Directors may be held in the principal office of the Company at Atlanta, Georgia at any time on call of the President, or of any three members of the board, or may be held at any time and place without notice, by unanimous written consent of all the members, or with the presence and participation of all members at such meeting.

4. Notices of both regular and special meetings, save when held on unanimous consent or participation, shall be mailed by the Secretary to each member of the Board not less than five days before any such meeting, and notices of special meetings shall state purposes thereof. No failure of or irregularity of notice of any regular meeting shall invalidate such meeting or any preceding thereat.

5. A quorum shall consist of a majority of the members of the entire Board. A majority of those in attendance, in the presence of a quorum, shall decide any question that may come up at the meeting.

6. Officers of the Company shall be elected by ballot by the Board of Directors at their first meeting after the election of directors each year. If any office becomes vacant during the year, the Board of Directors shall fill the same for the unexpired term. The Board of Directors shall fix the compensation of the officers and agents of the company.

7. The Order of Business at any regular or special meeting of the Board of Directors, unless otherwise specified for any meeting by the Board, shall be as follows:

(1) Reading and disposal of any unapproved minutes.
(2) Reports of officers and committees.
(3) Unfinished business.
(4) New business.
(5) Adjournment.

Article 3. Officers

1. The Officers of the Company shall be a President, Vice-President, a Secretary, and a Treasurer, who shall be elected for one year, and shall hold office until their successors are elected and qualify. The position of Secretary and Treasurer may be united in one person.

2. The President shall preside at all meetings, shall have general supervision of the affairs of the Company, shall sign or countersign all certificates of stock, contracts, and other instruments of the Company authorized by the Board of Directors, except as otherwise directed by the Board; shall make such reports to the Directors and stockholders as he may deem necessary or as may be required of him, and perform all other duties as are incident to his office or are properly required of him by the Board of Directors. In the absence or disability of the President the Vice-President shall perform his duties.

3. The Secretary shall issue notices for all meetings of stock-holders and directors, shall keep their minutes, shall have charge of the seal, and the corporate records, shall sign with the President instruments requiring such signature, and shall make such reports and perform such other duties as are incident to his office, or are properly required of him by the Board of Directors.

4. The Treasurer shall have the custody of all moneys and securities of the Company and shall keep regular books of account and balance the same each month. He shall sign or countersign such instruments as require his signature, shall perform all duties incident to his office or that are properly required of him by the Board, and shall give bond of faithful performance of his duties in such sum and with such sureties as may be required by the Board of Directors.

Article 4. Stock

1. Certificates of Stock shall be issued in numerical order from the stock certificate book to each stockholder whose stock has been paid in full, be signed by the President and Treasurer, and be sealed by the Secretary with the corporate seal. A record of each certificate issued shall be kept on the stub thereof.

2. Transfers of Stock shall be made upon the book of the Company and before a new certificate is issued the old certificate must be surrendered for cancellation. The stock books of the Company shall be closed for transfers 20 days before meetings of the stockholders.

3. The Treasury Stock of the Company shall consist of such issued and outstanding stock of the company as may be donated to the Company or otherwise acquired, and shall be held subject to disposal by the Board of Directors. Such stock shall neither vote nor participate in dividends while held by the company.

Article 5. Dividends and Finance

1. Dividends shall be declared from the surplus of the Company at such times as the Board of Directors shall direct, and no dividend shall be declared that will impair the capital of the company.

2. The moneys of the company shall be deposited in the name of the Company in such banks or trust companies as the Board of Directors shall designate, and shall be drawn out only by check signed by the Treasurer and countersigned by the President.

Article 6. Seal

1. The corporate seal of the company shall consist of a circle in the center of which will be the name of the Company and its date of incorporation, and such seal as impressed in the margin thereof shall be the corporate seal of the company.

Article 7. Amendments

1. These by-laws may be amended, repealed, or altered, in whole or in part, by a majority vote of the entire outstanding stock of the company at any regular meeting of the stockholders or at any special meeting where such action has been announced in the call of such meeting.

2. The Board of Directors shall not alter or repeal any by-laws adopted by the stockholders of the company, but may adopt additional by-laws in harmony therewith.

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